

INAPPROPRIATE LEARNING STRATEGIES IN YOUNG CHILDREN :
AN EVALUATIVE STUDY OF A REMEDIAL METHOD

by

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DECLARATION

I declare that the research reported in this Thesis was
undertaken by myself and that the Thesis has been written by myself.

Signed

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ABSTRACT

This study was designed to evaluate a method of developing learning strategies in young children considered to be at risk for learning difficulties, broadly defined as ineffective approaches to learning situations. The Flying Start, a programmed kit designed to help children learn to learn had been developed by D.H. Stott and was at the time that this project began (1974) in an experimental stage of development. There was a clear need to conduct a controlled, evaluative study of the method in order to demonstrate its validity.

The underlying objective in using the method is to permit children to bring into play dormant and underdeveloped skills which would facilitate more efficient functioning in learning situations. As the child experiences success in improving his task-approach strategies, inadequate and inefficient styles of responding are expected to drop away. The resultant positive changes in style are expected to generalise, so that the child's behaviour in the learning situation will be appropriate.

A pilot study using a small group of children in a Primary 1 class was most useful in indicating problems of presentation of the materials and method. For the main study, teachers of six Primary 1 classes in schools in the Tweeddale Division of Borders Regional Council, Scotland identified 34 pupils by means of a behaviour check list (Stott, 1972). Formal pre- and post-testing was carried out on these children. In the eight weeks between testing, half of the subjects were given the Flying Start programme in small groups for two half-hourly sessions

per week. The other half of the subjects were given a small-group programme of the same duration involving activities similar to those in the ordinary classroom. This was called the Control group.

Formal test results were analysed by t-tests and Mann-Whitney U. Comparisons were also made between the pre- and post-experimental profiles derived from the teachers' responses to the behaviour checklist. In order to heighten the demonstration of the effects of treatment on individual children, case studies were written for each of the seventeen children assigned to the Flying Start experimental group. Their reporting demonstrates the formative aspect of the evaluation.

The results of this study show that recorded advantages on formal testing and teacher profile analyses favoured the Flying Start group. These results were further supported by the case study descriptions.

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CHAPTER 1 INTRODUCTION

A. PURPOSE AND ORIGIN OF THE STUDY

A feature of the educational scene is the manner and frequency with which programmes are put into operation in the classroom without question of an evaluation, a feature which Scriven (1967) and Cronbach (1967) have for long made comment upon on the North American continent.

Tumin (1970) attempted over several years to create a model for evaluating educational programmes or systems, but eventually had to admit failure. He suggested there were two "external" reasons for this failure. One was that there appeared to be a "chronic lack of interest in anything resembling scientific evaluation on the part of local, state, and national educational officials". The other reason, he felt, resided in a lack of information in relation to "educational inputs, processes and outcomes".

A search of the literature on evaluation of programmes for young children does indeed induce frustration of the kind Tumin describes. Ryan (1971) suggests that one reason for the lack is that it is "too easy to assume that benefits will be automatic". Even where authors have made strong efforts to describe their work, e.g. Weikart (1970) Karnes (1969) Bereiter and Engelmann (1966), reports containing many important elements of programme design and use are seldom produced. Guralnick (1973) has stressed the importance in

evaluation of an intensive individual analysis of each child's behaviour. Guralnick's suggestion concerning the use of a formative type of evaluation may go a long way towards answering Tumin's charge that there is an "insurpassable gap between a full inventory of data on discrete parts of a process, and the 'summary' judgement of the 'meaning' of those parts taken together, when no arithmetic is available for aggregating the discrete data". Tumin (1970).

It is not surprising that Tumin's attempt to create a model should fail. The idea of such a model suggests that there exists a commonality of purpose among programme makers. Meanwhile, those involved in developing programmes are working either on the development of their own theories and models or on the kinds of assumptions about automatic benefits that Ryan (1971) was criticizing.

The Flying Start Learning to Learn, Stott (1971) programme was designed and developed during three years of experimental use in a remedial unit at the University of Guelph. It is both a method and a set of programmed procedures, aimed at assisting children who have been unsuccessful by their own efforts in developing their learning potential, particularly their use of strategy in problem solving.

At the time of the study, teachers in Primary schools in the area served by Moray House College of Education were becoming interested in using the materials for remedial purposes at the primary level. This interest was consequent upon Stott's participation in a symposium reported in Stone and Thomson (1974)

attended in the main by primary teachers, remedial staff and educational psychologists. Teachers at the Infant School level were beginning to use the Flying Start materials for teaching pre-reading skills, or in other words, as an aid in the prevention of learning problems.

Without benefit of a formal evaluation, the Flying Start could be legitimately criticised in the same way as these programmes previously mentioned. This study was undertaken as a first step in the process of evaluating the materials in their primary function as a method for developing learning strategies in children at risk for learning disability.

B. BACKGROUND TO THE STUDY

The definitions most commonly accepted of the "learning disabled child" demand that the child demonstrate a two year lag in academic skills before being thus identified. Children labelled as "learning disabled" are described as being unable to concentrate on or to succeed with required classroom work. Reasons offered consequent to formal testing include "auditory perceptual deficits" and "visual perceptual deficits". Programmes designed to cope with these apparent problems are built "almost exclusively around the weaknesses or deficits" Riessman (1964), and take no account of the strengths of the children under study, e.g., The Frostig Programme for the Development of Visual Perception (Frostig and Horne, 1964).

Many, interested in the prevention of learning problems, have attempted to produce programmes aimed at reducing the numbers of failing students. They contained two main underlying assumptions, namely: (a) it is "the disadvantaged" child who is at risk for learning disability: and (b) a rich and stimulating experience in a pre-school will prepare him for success in the early grades of school. An example of such a rationale applied to the development of programmes for the disadvantaged child is "Project Headstart"

Circirelli et al (1969) in their evaluative study of the project did not give any support for these assumptions.

The literature on the learning disabled is full of confusions and contradictions. Not the least of these is the inconsistency in regarding the learning disabled as unique ("the exceptional child"), while at the same time presuming that "the disadvantaged" will eventually become "the learning disabled".

An alternative approach is taken by Stott (1971), who considers that potential candidates for learning problems will be identifiable by their inappropriate learning strategies in the class situation. This pattern of ineffective behaviours is what sets the candidate off from the competent learners among his peers, and is the basis from which the infant class teacher often works intuitively to form her expectancy of the child's failure. In any classroom at the Primary 1 level there will occur some children whose ineffective learning strategies,

involving notably inattention to relevant aspects of the curriculum, marks them as being at risk for learning disability. In the same classroom, regardless of its socio-economic status, other children will have developed measurably effective learning strategies which will be recognized and accepted by the teacher.

Stott (1971) described several main types of inappropriate behaviours in the learning situation. Children exhibiting these behaviours may be identified by the teacher in an objective manner by the use of a checklist consisting of short descriptions of behaviours which occur in the classroom. Stott argues that using the intelligence quotient as a means of identification has proved of little value, and that "the way in which the child uses his perceptual powers may be more important than his absolute potentials". With this in mind, Stott devised the Flying Start as a "systematic programme for reinforcing good ones". The activities are designed to be enjoyed. This has been done by building the learning into games which are mostly self-correcting.

Chapter 2 will introduce evidence which indicates that it is possible to predict academic success or failure fairly accurately at the Primary 1 level. A logical step would be to assess the value of a preventative programme with the population at risk.

The present evaluative study, which is discussed in detail in subsequent sections, requires comparisons to be made between the effects of the programme on an experimental group and a control group. The design of the study therefore allows for

the run down assignment of subjects into groups:-

A Flying Start

B Control: comprising a programme of equal duration to the Flying Start programme involving activities similar to the ongoing classroom curriculum.

C. THE PROCESS OF EVALUATION

Bruner (1966) describes evaluation as "a form of educational intelligence for the guidance of curriculum construction and pedagogy". Three main approaches are taken to evaluation. These concern the effectiveness of: (a) a programme; (b) teaching methods; or (c) the students. The most important aspect of evaluation, however, is the provision of "feedback" (Whilhelms, 1967) for use in educational decision making at all levels (Astin and Panos, 1971).

Scriven (1967) defines several types of evaluation. There is "pay-off" evaluation, which involves the appraisal of pre- and post-test performance differences only. "Summative" evaluation is that which takes account of the end products of a programme. "Intrinsic" evaluation is that in which the learning context, resources, and intermediate (rather than final) outcomes are evaluated. McDill, McDill and Sprehe (1969) point out that one advantage of this method would be the identification of those aspects of the programme which were successful, despite overall negative results.

Lindvall and Cox (1970) assert that the evaluation of a programme serves to provide a true definition of the programme. This end may best be achieved by the evaluator if he examines every element and operation in the programme in such a way that the examination contributes to the improvement of the programme. Lindvall and Cox are speaking from the point of view of "formative" evaluation - evaluation that is built into the process of developing a programme Scriven (1967).

In the present study, the style of evaluation undertaken is most like that described as "formative", that is, ongoing and leading to an adaptation of the materials and method. Each item of the programme was studied operationally, and modifications in the method resulted. Pre- and post-achievement measures were made on the subjects. More importantly, progressive effects on the subjects, in terms of behavioural changes, are described. Wick and Beggs (1971) point out that the time during which the experimental conditions are in operation is rarely considered in the great proportion of research carried out in education. Most evaluative research, by this estimation, is not formative.

Many reported compensatory and other early programmes have failed to produce meaningful results in terms of the abilities of the subjects to cope with the everyday school situation. This would seem to be a good enough reason to demand some kind of evaluative study. McDill, McDill and Sprehe (1969) have outlined two possible reasons for the lack of evaluative studies in this area. One is that the true impact of a compensatory

programme may not be realised until the subjects become parents. Another reason is the cost factor. However, Wick and Beggs (1971) have shown that the costs of continuous assessment of some school programmes would be relatively low. Moreover, they stress, "the investment in this approach toward hard output data will lead to the strengthening and support of effective programmes, and the eventual elimination or reduction of weak ones".

"Most contemporary evaluations of instruction begin and end with achievement testing", Stake (1967). The methods of formative evaluation, incorporating varied assessments, may go some way towards the prevention of the interpretative bias which is likely to occur when the evaluation of a programme is limited to a summary test score, which, by its narrowness, prohibits a full exposure of the impact of the programme in terms of learning events. McDill, McDill and Sprehe (1969) recount how almost every experimenter in the field of compensatory education "supplements the test scores with accounts of the enthusiasm for it expressed by parents". In the present study, it was expected that the provision of instant feedback in simple self-checking situations would affect the task perceptions of the participants so that their abilities to deal with learning situations would be enhanced. Since behavioural change was the expected outcome, the possibility of using only simple test re-test measures was eliminated from the inception of the study.

A common criticism of programmes is that their aims are often stated in terms of "programme objectives" which permit the inclusion of unwarranted or ambiguous generalities. This

point of criticism is made most notably by writers such as Gagne (1967); Tyler (1969); McDill, McDill and Sprehe (1969); Lindvall and Cox (1970). This may be what Scriven (1967) means when he warns that "the verbally espoused goals of a curriculum maker are often not the implicit goals of his curriculum". Eisner (1966) has pointed out that "objectives are only known to us in any complete sense after the completion of the act of instruction".

Gronlund (1970) explains that instructional objectives may be more profitably defined as "learning outcomes", a notion which may satisfy some of the objections concerning the rigidity which the term "objectives" imposes on interpretation. As Ebel (1973) and Scriven (1972) note, the prescription of detailed objectives prohibits the flexible adaptation of instruction to learner needs.

Stake (1967) has attempted an alternative analysis of the problem. Figures 1, 2, and 3 are diagrammatic representations of the Stake model. The data, Stake explains, are of two kinds:

- (1) objective descriptions of goals, environments, personnel, methods, and content, and intermediate and long-range outcomes.
- (2) recorded personal judgements of the quality and appropriateness of goals, inputs and outcomes.

The model allows for comparisons to be made between the intended and observed outcomes at all stages of the evaluative

FIGURE 1. Statements and data to be collected by the evaluator

Intent		Observations		Standards		Judgements	
	1	4		antecedents	7	10	
	2	5			transactions	8	11
	3	6		outcomes		9	12

Descriptive Matrix

Judgement Matrix

FIGURE 2. A representation of the processing of descriptive data

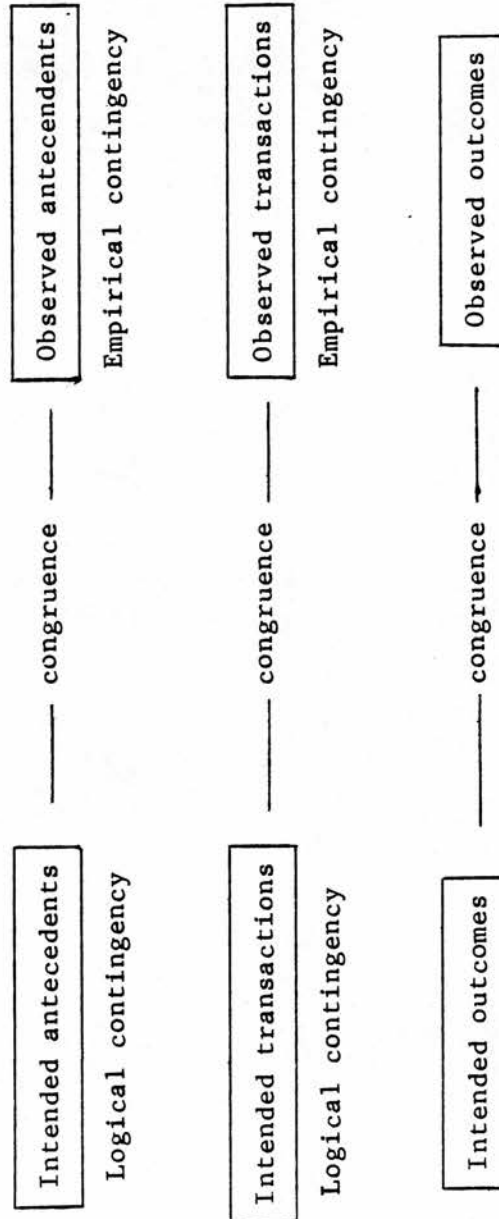
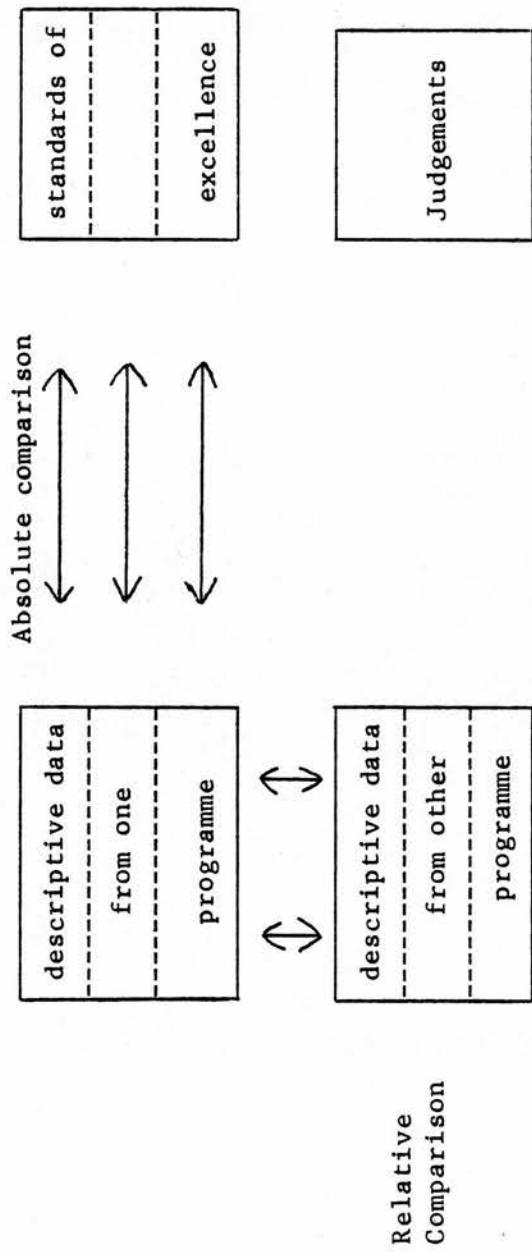


FIGURE 3. A representation of the process of judging the result



process. With the progressive identification of failure and successes, the system is open to modification and also may provide immediate answers for decision making.

The structure of the present study appears to satisfy the major conditions imposed by the Stake model, in the sense that logical (or anticipated) aims lead to observable empirical outcomes. There is distinct and precise definition of goals and of implications to be drawn. In addition, the method was designed to bring about defined changes in the behaviours of children in learning situations. These changes are observable over time. Descriptive and judgemental data are provided concerning goals, inputs and outcomes.

A concern of Tyler (1969) is "the role of the learner in learning and related notions about the nature of knowledge" as basic assumptions in educational evaluation. Tyler outlines (two) alternative views which educators take:-

If we conceive of the learner as one who is learning to make appropriate responses to situations outside his control, we are likely to think of learning as a kind of conditioning in which the only choice open to the learner is to react "correctly" or to refuse to respond. On the other hand, learning may be viewed as a process by which the learner develops a behaviour that enables him to deal satisfactorily with the situation which he confronts in a way that more nearly achieves his purpose. (Page 399)

Dewey (1915) had argued along these lines in asserting that "all depends on the activity which the mind itself undergoes in responding to what is presented from without". It is this view of the learner which most nearly describes the approach taken

by Stott (1970) in his design of the Flying Start programme. The question posed by Lindvall and Cox (1970), "Are the goals worthwhile?" can thus be answered in the affirmative for the Flying Start, since the intent of the programme is to provoke the development of strategies for problem solving.

A final but vital question concerns the evaluator. Spicker (1971) calls attention to the fact that several of the well-known early childhood programmes were designed, taught, and evaluated by the authors themselves. Spicker claims this is true of Bereiter and Engelmann (1966); Karnes (1969); and Weikart, (1967). These programmes, as pilot studies, drew a great deal of attention, which McDill, McDill and Sprehe (1969) refer to as a Hawthorne effect among administrators. McDill further argues that the effect of the "charismatic innovator will frequently disappear when the project is imported or disseminated to other less dedicated persons" This criticism must be of real concern to the designer of programmes. However, in Scriven's opinion (1967), the use of a professional formative evaluator may be an acceptable answer to the problem. The present investigator attempted to perform such a function. In this report, an attempt was made to meet Stake's (1967) requirements that: "a full evaluation results in a story, supported perhaps by statistics and profiles. It tells what happened It tells of merit and shortcomings".

CHAPTER 2

RELATED RESEARCH

A. EARLY IDENTIFICATION AND REMEDIATION

a) Introduction

Attempts at remediation of learning problems at late stages of the child's school life have proved very expensive, necessitating significant expansion in special services. Even then, these attempts have not been outstandingly successful, Bradley and Earp (1970). In addition to the serious difficulties involved in attempting to "remediate" children whose educational difficulties have been compounded by emotional reactions to failure, there are the questions of inadequacies in the areas of diagnosis and treatment, both in terms of techniques and personnel (Chalfant, 1969 and Alber, 1968).

It is therefore in the interests of the children with whom educators are concerned that the process of early identification and remediation be encouraged. Pringle (1966) in a study on 11,000 7-year olds, reported that about "13 per cent of 7-year olds show behaviour indicative of maladjustment" as measured by the Bristol Social Adjustment Guides, (Stott and Sykes, 1956). Pringle concluded that the proportion of "educationally backward and emotionally maladjusted children appears to be high enough by the second year in the infant school" to warrant increasing support of the emphasis which is being placed on early detection and prevention. A great deal of evidence has now accumulated

that both these measures are feasible, in spite of the serious doubts raised by the failure of such programmes as Head Start for example, (Jensen, 1969).

The ideal situation would be that which guaranteed significant early preventive measures so that children could arrive at school well prepared to interact with and take advantage of the Infant School programme. Schwebel (1967) has summarised the thinking of this topic:-

With the fixed theory of intelligence now under attack, with growing demands for more and better education for more people, it is asserted that if change is to take place in the educability of our children it must occur before they enter school. Yet this is precisely when society has least control over the situation. (Page 306)

The task of reaching all children before they arrive at school is clearly impossible using present methods of private nursery, pre-school playgroups or even local authority day nurseries. The chances of providing adequate programmes for all pre-school children takes us even further into the realms of fancy.

Simpler, and less expensive means of prevention are, however, already outlined in the literature. Skeels' (1966) study may be the most dramatic example. As a result of simply moving his experimental group of thirteen children (all classified as mentally retarded) from one institutional environment to another, Skeels was able to report a "marked increase in rate of mental growth" over two years, with an average gain of 28.5 IQ points. The contrast group, on the other hand, showed an average loss of 26.21 IQ points. In adulthood the two groups "had maintained

their divergent patterns of competency". The major difference between the two institutions experienced by the children in the early stages of the experiment was in the amount of development, stimulation and the intensity of relationships between the children and the mother-surrogates. Skeels found that the contrast group, for whom intervention was essentially limited to custodial care, had cost the state five times as much as had the experimental group, and that another twenty to forty years of cost to the state could be anticipated for at least four of the contrast group.

With regard to less extreme cases, Jensen (1967) has described a method which would involve girls taking a long-term practicum in home teaching of children between six months and four years. Benson (1970) also proposed a school programme aimed at early prevention.

Zigler (1971) believes "that the development of the child does not begin the day that he is born - or at age three - but much earlier, during the formative years of his parents". Stott (1972) has prepared a book specially designed to help parents develop learning strategies in their pre-school children. Meier (1971) has also pointed out that parents are capable of preventing learning disorders by the systematic training of, for example, sequencing strategies.

The idea of formally training very young children in academic pursuits is of course not new to the English speaking world. For example, a book was written in 1834 by Thomas Bilby

in response to frequent enquiries for directions to aid in the setting up of new infant schools. Children were admitted into these schools between the ages of eighteen months and six years; they attended both morning and afternoon sessions. The day began with reading and spelling, in classes of seven or eight, presided over by monitors. The first class consisted of children learning the alphabet, while "those who spell in two letters" formed the second, and so on.

Generally speaking, today's school children begin their formal education by entering the Infant School at age five. In most cases they have not attended pre-school playgroups or nurseries and their training at home has not usually prepared them for the classroom routine. As White (1971) has shown some of these children will be highly competent, regardless of the face value of their backgrounds.

The challenge for the teacher is to provide what Hunt (1961) has described as the best possible "encounters" between the child and his environment, for the development of his strategies for processing information. The situation exists in which an expectant, captive population may be influenced by what Gagne (1965) has described as "conditions of learning", if these are set up. The Infant teacher receives children in groups whose heterogeneity defies description. Some of these children will be "at risk" for learning disabilities, and will need to be provided with an environment which takes their learning difficulties into account.

b) The Disadvantaged

Of the many criteria for identifying the potential learning disabled child, the most commonly used is the family income. In the literature of the 1960's, the fashions of "learning disability" and the "disadvantaged" developed simultaneously when it was allegedly discovered that, in the United States, at least, vast numbers of poor children were functioning at exceptionally low levels of achievement.

The false belief in the link between socio-economic standing and school performance has not been developed solely within the province of early education. Floud and Halsey (1961) reported that despite controls which were supposed to take account of ability to profit from exposure to grammar schools in England, the trend developed in years 1952, 1953 and 1954 which reflected "a slight but persistent diminution of opportunity for working class boys and a corresponding increase in opportunity for those at higher social levels ... at any given level of ability". (Page 214)

There is no question but, that the children of the poor have less chance of being healthy - Pasamanick (1959); Drillien (1964), and less chance for compensating for their early physical drawbacks, Birch (1969). Grotberg (1970) has summed up the situation by saying that "the disadvantaged child is likely to be subjected to both nutritional and emotional deficits with resultant learning disabilities". (Page 326)

In two reviews of the literature on Head Start programmes, Grotberg (1965, 1969) found repeated evidence that impoverished

children compared unfavourably with middle class children on tests measuring language development, cognitive, intellectual and achievement behaviour, social and emotional behaviour, auditory and visual perception and conceptualisation. Findings such as these are easily gleaned from the literature, and serve to support the expectations set up by writers such as Hess and Shipman (1965) and of Kagan (quoted in Denenberg, 1970), whose delineation of "seven major kinds of differences between poor and privileged" mark children from deprived backgrounds as being deficient in a number of areas. Involved here, as Cazden (1970) has phrased it, is "the basic non sequitur, and a shockingly prevalent one, - the leap from correlation to causation".

A few writers cast fashionable assumptions and expectations aside while they consider factors relevant to the individual. Jensen (1967) points out that the slum child "with a high IQ and superior school achievement is often not regarded as being culturally disadvantaged, while low achieving pupils from what may appear to be very similar home backgrounds are characterized as disadvantaged and their poor school performance is attributed largely to this condition". (page 4)

Another point which Jensen (1967) makes is that there is no evidence that what we might call basic learning ability is absent in the population classified as "disadvantaged". Assessments are almost universally made by means of the IQ test "which grossly under-estimates learning ability among lower class children", especially if, as Jensen claims, intelligence tests account for

no more than fifty per cent of the variance in school achievement. Learning ability, Jensen (1963) says, should not be thought of as a single unitary ability. Jensen dramatised this point with his examples of fast and slow learners in the 1963 study. The fastest learners in the entire study had IQ's of 147 and 65. Jensen hypothesised that the normal and fast learners in the group labelled retarded had simply "failed to learn the kinds of behaviour which are necessary as a basis for school learning and for the acquisition of the kinds of knowledge and skills tapped by IQ tests".

Related to this is the research of Zigler and Butterfield (1968) who showed that the average ten-point increase produced by a year of Head Start could be matched within a few weeks using warm and encouraging test procedures. The authors concluded that "the deprived child suffers from an emotional and motivational deficit which decreases his usual intellectual potential as measured in an optimising test situation". Zigler and Butterfield make the further rational suggestion that intervention programmes such as Head Start should be assessed in terms of their success in fostering greater general competence rather than their success in developing cognitive abilities alone, cognitive abilities here being interpreted as IQ scores.

What Jensen (1963) and Zigler and Butterfield (1968) may be arguing for is the importance of fostering and assessing the problem solving abilities of children with whom they are dealing. Gagne (1966) sees the need for a "proper growth of respect for

the requirements of problem solving", by means of a "defusing of intellectual activity from the demands of immediate action, affect and drive". With the resulting experience of intrinsic reward from increased competence he argues, begins a career of learning for its own sake.

While the standard measures of intelligence may continue to show strong cultural biases in favour of the higher socio-economic population, optimal training and testing, involving developmentally relevant problem-solving activities, may add significantly to our understanding of the range of intellectual potential which exists within populations regardless of financial or other living standards.

c) The Relevance of Neurological Factors

Various researchers have drawn attention to the fact that certain populations of learning disabled children include significant numbers of children whose neurological integrity is questionable. The hyperactive child, sometimes also referred to as the hyperkinetic child, has been the subject of considerable study - Stewart et al. (1966); Weiss et al. (1971); Werry, Weiss and Douglas (1964); Werry (1968); Ackermann, Peters and Dykman (1971); Laufer and Denhoff (1957); Thomas, Chess and Birch (1968). In their study of children with brain-damage, Thomas, Chess and Birch (1968) identified only one subject as hyperkinetic. Their observation was that the hyperkinetic syndrome does occur in some children as a result of central nervous system damage.

However, they argue, the sequelae to such damage can be most diverse, and depend, to a certain extent at least, on factors of temperament and reactions to the environment encountered by the individual child.

Since the work of Strauss and Werner (1947), and later of Cruikshank (1966), in which a syndrome of behavioural dysfunction was described, the question of the clinical or educational worth of the term "brain damage" has been raised. This term has become synonymous in the literature with the "hyperkinetic syndrome", the "Strauss syndrome", as well as with such terms as "distractibility", "perceptual deficit", "minimal brain dysfunction", and even "learning disability". Educationally, the value of the term may be of limited use in simply preventing us from attributing undue weight to the aetiological role of social environment or parental care - Hertzog, Bortner and Birch (1969).

Wedell (1970) speaks of "perceptuo-motor processes" which, he concludes, influence behavioural and educational competence in rather indirect ways, and from which prediction may be quite unreliable. Wedell's views lend support to the current disenchantment with methods of "identification" and "remediation" associated with perceptual-motor development (e.g. Kephart (1960); Frostig (1964); Getman (1965); Barsch (1965) and Delacato (1968).

The Frostig (1964) programme particularly has been the

subject of much recent review. This may be because of the widespread use, for remedial purposes, of the Frostig Developmental Test of Visual Perception (DTVP), which claims to assess eye-motor co-ordination, figure-ground perception, form constancy, perception of position in space, and spatial relationships. A significant reason for the popularity of the Frostig test is that it is easily administered. In addition, Frostig has supplied a programme for the proposed remediation of the "deficits" uncovered by her test.

As a result of a factor analytic study on the DTVP, Boyd and Randle (1970) found that only one Visual perceptual factor is being measured, and these authors seriously questioned the use of the instrument as a predictor. Olson and Johnson (1970) found that the DTVP was the poorest ^{predictor} of reading ability in their study, also agreeing with Boyd and Randle (1970) as to the unifactorial nature of the test.

Approaching the problem from the angle of possible prevention of learning difficulties, Falik (1969) and later Keim (1970) provided special perceptual-motor training programmes as part of a general Infant class curriculum. Neither of these studies produced significant differences on the readiness and intelligence scores of the Infant-class children involved, and both authors questioned the relevance of providing such a programme in any regular curriculum.

Among the neurologically affected children who may suffer learning problems are the "clumsy" children, whose imperfect

motor organisation deprives them of early approval and inculcates in them a sense of failure long before school starts Wedell (1970). Touven and Precht1 (1970) have described a similar course of events for the child with "slight nervous dysfunction".

Finally, Birch and Belmont (1965) have described a high correlation between "auditory-visual integrative performance and reading skills in younger children". Support for this research finding can be found in the analysis of reading skills described by Smith (1971). "What the child needs" says Smith, "is association between visual and acoustic features". Smith refers to the development of, "mediated word identification skills", which involve the receiving of information, the making of a response, and getting appropriate feedback.

The acquisition of the integrative function described by Birch and Belmont (1965) is likened by them to "learning to learn to read". The most rapid period of development of this function occurred (in their sample) between the ages of five and seven years, very little improvement being shown after the age of seven years. If Birch and Belmont and Smith are correct in their conclusions, tests which simply attempt to tap individual sense perceptions will become irrelevant for the researcher in this field, as compared with strategies of reading.

d) Attention and Motivation

It may be fortuitous that "research on attentional processes is one of the primary growth areas in psychology and education today" LaCrosse (1970), since "the attention span", its frequency and duration, is commonly considered by teachers to be one of the major areas of concern in the area of learning disabilities. Broman (1970), observed particular children, from age five to eleven years, who had been identified by teachers as having learning difficulties due to a short attention span. Broman found that in all cases the children were capable of engaging in long periods of concentration, under optimal conditions, about which the children were highly selective. Broman's findings support her contention that the short attention attributed to children is a "myth". The facts are that teachers are not identifying the true cause of difficulty. A term such as "attention span" requires definition if it is to be of use for identification and prediction. It seems that the teachers in Broman's study had used highly selective criteria which led them into errors of diagnosis.

Meyers, Attwell and Orpet (1968) showed that it is indeed possible to rate attentional behaviour accurately, given the definition as "the ability of the subject to put forth a mental effort and to concentrate at the task in hand". These authors had examiners rate the attentional skills of Infant class children during a testing situation. They found that

attention measured in this manner was predictive of Primary 5 achievement, particularly of reading. This suggests that the testing situation at the Infant class level may present an ideal opportunity for maximising response levels, because of the nature of the testing materials. Properly handled, the features of complexity, surprisingness, uncertainty and conflict (Berlyne, 1968) could be manipulated in the testing situation in such a way that the attenders would be differentiated accurately from the non-attenders.

Presuming that the children studied by Meyers, Attwell and Orpet (1968) were subject to a normal school environment, one could hypothesise that the "good" or "relevant" attenders would have been consistently and positively reinforced during the intervening years, while the "poor" or "irrelevant" attenders would have been consistently and negatively reinforced. If these circumstances do indeed obtain, as is likely, then such a method as the Test Behaviour Observation Guide - Attwell, Orpet and Meyers (1967) may reliably be used as a predictor.

Another point of interest in this study was that "attention" was measured separately from "co-operation given to examiner", the latter item having no predictive value. In this situation at least, the interpersonal relationship was of little account, in terms of co-operation, whereas attending to the job in hand in a learning situation was of vital importance. Jensen (1967) noted the phenomenon of deterioration of the disadvantaged child's attentional ability, usually beginning in the first year at school,

after which "normal attentional behaviour gives way to a kind of seemingly aimless and disruptive hyperactivity". Jensen suggests that there may be too great a gap in difficulty between the tasks required in the first year at school and those encountered in the second. Hunt (1967) explains that there must be sufficient congruence between the child's capacities and the challenges presented to him from the environment to allow him to be interested in mastering the world. "Abnormal cognitive and emotional development derive from a mismatch between the child's capacities and the challenges presented to him". Lichtenberg and Norton (1971).

Fisher (1970) attempted to validate a series of previously used attention measures by comparing them with teachers' ratings. The teachers rated normal middle class children on the Strauss and Kephart (1940) attention rating scale. Fisher found that the teachers' ratings relied heavily on "concentration on visual stimuli", and seemed largely to ignore the child's flexibility in shifting from one mode of activity to the other. In other words, the teachers did not consider the total attentional attitudes of the children. The correlations between the teachers' ratings and the actual attention tests Banta (1969) were relatively low, although the mean interjudge reliability coefficient on the ratings was 0.88.

In his review of the research of the development aspects of attention, LaCrosse (1970) has underlined the notion expressed by Hunt (1969) of the "importance of early experience

for the perceptual, cognitive, and problem solving functions". It is interesting to note that Hunt, in making this statement, implicitly rejects his earlier hypothesis (Hunt, 1968) that the disadvantaged child has an initial "stimulus advantage" over the middle class infant. The conditions which Hunt (1968) had described as existing in the early life of the deprived child are reflected in the findings reported by McCoy and Zigler (1965) that this child tends to be more wary of adults and also in Stevenson and Fabel's (1961) findings that such a child is more motivated to securing their attention and praise. Zigler and deLabry (1962) however, added that the same child is less motivated to being correct for the sake of correctness alone. These factors would place a child at a decided disadvantage in producing task-relevant attentional habits in developing strategies for evaluating information.

The evidence building up in the literature on child development would seem to indicate that it is the nature and quality, and to some extent the timing and duration of the presentation of stimuli which are critical in developing relevant motivational attitudes and attentional abilities. For example, Watson (1971) conducted an experiment in which infants learned to control the movement of an overhead mobile. Other infants, not initially taught to control the mobile, did not subsequently learn to do so when presented with the opportunity. Moreover, those infants who learned to control their mobiles "displayed vigorous smiles

and cooing behaviour" toward the object, and demonstrated preferences for attending to the moving object, while the group, not experiencing response-contingency stimulation did not show this behaviour. Watson concluded that "the ability to learn that something is uncontrollable is probably nearly as adaptive as the ability to learn to control those things which can be controlled".

When considering the area of learning disabilities, information which demonstrates the relation of attentional processes to learning strategies is by definition of the utmost importance. The development of adaptive attentional abilities is viewed here as primary to achievement motivation. Environments which fail to supply the attentional stimuli which can be accommodated in a developmental sequence also fail to encourage the development of that "motivational" confidence that one can control one's environment and obtain one's ends" LaCrosse (1970). Consequently the feeling of efficacy or sense of mastery which White (1959) has described as a "fundamental motive" on the growth of personality, may be severely damaged.

Bruner (1966) describes the "stunted organism" as one deprived of a "rich diet of impressions on which his curiosity feeds with such extravagance". Curiosity, the drive to achieve competence, and reciprocity, are inseparably bound as the basic intrinsic motives for learning, in Bruner's view. The cutting off of opportunities to experience variations in circumstances,

(paying attention to stimuli, developing curiosity) may lead to a "retardation in intrinsic motivation". Hunt (1967).

It is important, as Zigler and Butterfield (1968) stress, that motivational deficits be identified in the young child and that nursery programmes be implemented which are geared specifically toward changing adverse motivational patterns. Fortunately, experiments which encourage the learning of strategies of responding, such as those of White (1965), and Cantor (1964) suggest that there is probably a great deal of flexibility for learning within a given development stage, as LaCrosse (1970) has pointed out.

e) Behavioural Aspects

The search for behavioural prediction of learning problems generally assumes that the "trait" resides in the child. Adelman and Feshbach (1971) believe, however, that a youngster's success or failure in school is most fruitfully viewed as a function of the interactions between his skills and behaviours and the specific classroom situational factors he encounters. The demand characteristics of the particular classroom will require that the child respond with an appropriate behavioural style if he is to experience success in the situation. These authors have criticised the use of restricted approaches to the problem of predicting school failure. Assessment undertaken quite outside the conditions of the classroom "entails markedly

different performance conditions than are to be found in the classroom", and yields limited information. The ecologically valid procedure of considering the "living variables of the classroom situation" would result, according to LaCrosse (1970) in moving research "in more relevant directions, while simultaneously motivating educational professionals to implement research findings".

Wedell (1970) has attempted to compensate for the admitted inadequacy of the psychological assessment of children with learning difficulties by developing a "sequential diagnostic strategy to the diagnosis of the cognitive and educational features of children's learning difficulties". The strategy, while extremely thorough and logical, continues, in the tradition of psychological individual testing, to avoid the face-to-face educational situation with which the child is failing to cope.

A more practical approach is taken by Alper and White (1971), who propose that teachers could become actively involved in the behaviour-change process at the time of referral, by using forms which bear descriptive statements of observable behaviours. In addition, the information supplied would lead to more rapid intervention and greater co-operation between teacher and psychologist. This approach ties the assessment procedure to those facets of the classroom instructional process which can be systematically varied - Quay (1968), and allows that both child and environment are necessary areas of investigation - Oakland (1969).

Cowen, Dorr and Orgel (1971) believe that in order to combat the current situation in which "primary prevention is largely an abstraction", rapid and accurate measures are desirable. To this end, they have carried out several investigations into the use of teacher's behavioural checklists. The most relevant of these studies Cowen, Dorr and Orgel (1971) was concerned with a comparison between four previously validated screening devices. These were: the Teachers Behaviour Rating Scale (TBRS) (Cowen, Zax, Izzo and Trost, 1966); the Teachers Adjective Check List (TACL) (Cowen et al, 1966; Zax and Cowen, 1969); the Ottawa School Behaviour Survey (OSBS) (Pimm and McClure, 1966) and the AML Behaviour Rating Scale (AML) (Brownbridge and Van Fleet, 1969). The investigators found substantial relations among the measures. They also report that the scales reflected common variables.

The total AML scores was the strongest correlator of all measures used in the study. Moreover, the AML had the advantage of the availability of area subscores and briefness. The AML is an all item scale which includes five aggression items, five moodiness items and one item that reflects learning disabilities. Sum scores range from 11-55. The scale requires about one minute per child to complete. The authors ensured that the teachers would be quite prepared to use the scales according to their design by having the ratings made in mid year, by which time the teachers had had time to observe the behavioural styles of the children. Other investigators Conrad and Tobiessen (1967);

Tobiessen, Duckworth and Conrad (1971) have been interested in developing much lengthier behaviour assessment devices. For example, there are 14 scales in the battery devised by Conrad and Tobiessen (1967) for use at pre-school and first year levels.

Relatively few behavioural assessment devices for use at the first year infants level are reported in the literature, and even fewer attempts have been made to assess the incidence of maladaptive behaviours at this level. The report by Pringle, Butler and Davie (1966) concerning "11,000 Seven Year Olds" is an important exception. Using the Bristol Social Adjustment Guides Stott and Sykes (1956), these authors reported 12 per cent of British 5 year-old children as "unsettled" after three months in school. Other British studies have involved older children. For example, Chazan (1968) looked at "inconsequential behaviour" in 8-12 year old Welsh children (described as "restless and lacking consistent purposefulness", as measured by the Bristol Social Adjustment Guides). Rutter, Tizard and Whitemore (1970) discussed in the Isle of Wight survey some 2,000 children between 9 and 11 years old. Of these 5.7 per cent were said to be maladjusted. In this case the interpretation of maladjustment was that the children were considered to have "some clinically important psychiatric disorder".

There are no reliable methods of estimating the percentage of children in these studies who would have been considered "at risk" at the first year Infant stage. Rutter, Tizard and

Whitemore (1970) point out that forecasting from their own data would also be quite unreliable. The importance of such findings, they say, is that they may lead to the "present relief of suffering in the child". On a much smaller scale, Rubin and Balow (1971), with a sample of 243 first-year Infant school children found that 23 per cent of 5-6 year olds were reported as showing problems of attitude and/or behaviour. The decision as to what constituted a problem was left to the individual teacher and this may be considered a basic weakness in the Rubin and Balow design. Whereas, it may be the case that even well-established disturbance does not necessarily interfere with learning Rabinovitch (1964); Bower (1962), children who ultimately develop behaviour disorders are notably instructional problems Bower (1962), and frequently fail under normal school conditions. To quote the corollary: "The well adjusted failing child is hard to find" Ford (1971). For example, Cowen, Zax and Trost (1966), in their study of "red-tag" children * who remained at school found that by the end of the third school year, the child with early diagnosed emotional disorders had suffered impairment in the academic, adjustment and behavioural spheres.

Studies of the incidence of maladjustment report fairly clear sex patterns. The ratio of boys to girls diagnosed as maladjusted is noted by Davie (1968), and Rubin and Balow (1971)

* A red-tag was applied to the folders of the first year children considered to be "at risk" for moderate to severe maladjustment. This figure ran up to 37 per cent of the total group in the original sample.

as two to one. Beilin (1959) reviewed thirteen studies in which the proportion of boys to girls identified as maladjusted ranged from 66% to 88%. The nature of the behaviours which form the bases for these identifications also appear to be sex-linked. Beilin (1959) and later, Ziv (1970) reported that the teachers preferred the less active, more compliant behaviour of girls to the more aggressive behaviour of the boys. In the study by Pringle, Butler and Davie (1966), the pattern which emerged for the boys showed more aggressive and more restless behaviour.

Ullman (1952) interpreted the difference in teachers' analyses of sex-typed behaviours as meaning that the boys' pattern of adjustment are more manifest to the observer, whereas girls deal with problems on an "intra-psychic level". Although Beilin (1959) reacts to this interpretation as being "in the tradition of imputing lack of insight to teachers", Bayley (1968), from her longitudinal studies, found "considerable independence of the girls' intelligence from personality variables". Rubin and Balow (1971) have also suggested that schools and teachers are oriented to a narrow band of expected pupil behaviours which are not consonant with typical behaviour patterns of young boys".

Davie, Butler and Goldstein (1972) suggest that the adoption of the female role for the girls is relatively easier than the male role for the boys, both from the home and early school experience. In the home, the mother's role is more

evident, through her tasks, while the father's occupation may be difficult for a boy to replicate in imaginative play, and even to comprehend. Since these points of reference are less clearly demarcated for the boy, good adjustment may be more difficult for him to attain.

The tendency for maladjusted behaviour to fall into under-reacting or over-reacting types has been noted by several researchers, although slightly different terms are used. Bower's (1962) findings of teacher ratings on emotionally disturbed children are phrased "overly aggressive or defiant" and "overly withdrawn or timid". The AML scale Brownbridge and Van Fleet (1969), is dichotomised in terms of "aggression" and "moodiness", which appear to be similar constellations. Rutter's scale (1967) distinguishes "neurotic" or "anti-social" types of children. By inspection, the items in these categories appear also to resemble descriptions of withdrawn versus aggressive behaviour. Quay, Morse and Cutler (1966) describe three dimensions which they label "personality", "conduct" and "immaturity" factors. Those factors referred to as "conduct" and "personality" disorders bear strong resemblance to the aggressive-withdrawn dimensions described in other works. The third factor, "immaturity", is reported to have accounted for much less of the variance than the other two. Different terminologies, however, often reflect varying attitudes towards the severity of symptoms and towards the treatment requirements.

There has been a long-standing division between psychologists and teachers on the relative importance of the under-reacting (or withdrawal) behaviours and the over-reacting (or overt aggressive) behaviours. Beilin (1959) reported that teachers were less concerned with withdrawing behaviours and more concerned with over-reacting behaviours, while psychologists took the opposite viewpoint. Ziv (1970), in Israel found a similar tendency, though the discrepancy between the judgements in his sample was considerably reduced.

The question of which behavioural style has more significance educationally is not considered by Stott (1971) to be the vital issue. Both behavioural styles are evident in the school population, according to his most recent classification in percentages of 19.3% and 22.6% respectively. The questions which are of concern relate to the nature of behavioural styles and the steps which may be taken, in the educational setting, to modify the interaction between particular children and the environment, so that learning may take place. With this in mind, the Guide to the Recording of the Child's Behaviour in the Learning Situation Stott (1972) was designed for the classroom identification of children who use faulty approaches to learning which may be due to temperamental, cultural or neurological factors, or a combination of handicapping events.

Stott (1971) presents a behavioural approach to learning and learning disabilities. He believes that cognition is part and parcel of the behavioural system, and that in order to

understand the cognitive processes in the child one must understand his behavioural system. In stating that the concept of intelligence should not be thought of as an explanation for individual differences, Stott suggests that it may be worthwhile to go back to the stage of uncommitted observation. He continues thus:

"It is instructive to observe the spontaneous ways in which a representative group of five-year olds tackle tasks. Some set about learning with an admirable strategy, without needing to be taught how to do so. Others, in varying degrees, do not know how to learn. Whatever 'intelligence' they possess is not being used properly. In effect, those who of their own accord use good learning strategies come to be looked upon as the intelligent children, and the others as the not so intelligent". (Page 3)

In Stott's opinion, one should train oneself to observe the different learning styles that children adopt so that children can be taught to learn. If a child has difficulty in profiting from the school curriculum or in adapting himself to the situation, it may very well be due to a faulty learning strategy that the child has acquired through past experience. The fact that a child may show a faulty learning style does not, however, mean that he is incapable of manifesting effective learning habits. The capacity for the latter may have developed but never brought into use.

Stott has identified two primary types of behaviour disturbance that may be evidenced in the child's learning style; "unforthcomingness" and "inconsequence". The "unforthcoming child",

according to Stott, is recognised by his meek manner, his submissiveness, unventuresomeness, and, in extreme cases, complete unresponsiveness. The basic handicap is explained not as a withdrawal in the sense of being unconcerned or defensive about human relationships, but as an impairment in "effectiveness motivation" Stott (1969). This concept refers to the level of effectiveness or competence that an individual demands in his transactions with the environment. The "inconsequent child", on the other hand, may have good "effectiveness motivation". He, however, is too impulsive and often fails to think before acting. His trial and error takes place in actual behaviour, usually with unfortunate results, and he acts without checking the consequences of his actions Stott (1971). He fails in cognitive rehearsal and in reflectivity and thus, in the learning situation may be considered "at risk" insofar as his behaviour is inimical to successful learning.

Both inconsequence and unforthcomingness are seen to be detrimental in the learning situation, and if educational methods are to succeed, one must aim to modify the style of the child so that effective learning will proceed. The first step in this direction is the direct observation of the child's learning style. It is to this end that the Guide to the Child's Learning Behaviour Stott, (1972) is designed.

f) Readiness

One of the greatest problems with the notion of "readiness"

is that we are dealing with a concept which has, like beauty, no universally acceptable definition. The general confusion surrounding the term is exemplified in the account by Blank and Solomon (1969) of their observations during a session between a trainee teacher and a small girl:

When the teacher did initiate material, she posed seemingly simple questions which, in reality, were of enormous complexity. Since the teacher did not have the techniques for analysing where the child's difficulties lay, she assumed that the concepts involved were well beyond the child. The failures to recognise the complexity of her questions reinforces the philosophy that thinking cannot be accelerated but must merely wait until the child is "ready". The teacher thus abdicates her leadership in favour of the ephemeral concept of "readiness". Consequently, she assumes her role as merely structuring the surroundings so as to set the stage for the spontaneous emergence of reasoning. (Page 60)

Thus in the mind of the teacher "readiness" is seen to be related to the idea of growth and stages of development, which have traditionally been related to age.

It is highly probable that the traditional approach to readiness described by Blank and Solomon (1969) would leave children at risk for learning disability in precisely that condition.

Indeed, the number of cases reported, and the estimates of the prevalence of learning disabled children attest to the contribution made by this fallacious attitude.

Gagne's (1968) approach would forbid inaction, at least, and would attempt to deal with the problem at issue, which is learning. Gagne emphasises the influence of learning rather

than growth on human behavioural development. His argument is that if we concern ourselves with the notion of growth, we will be caught up in the same trap as the teacher in the illustration. If we consider the process of learning, on the other hand, we do not spend time waiting for something to happen. Stages of development, argues Gagne, are not directly related to age, except in the sense that learning takes time. The particular stage of development of any learner will depend on what the learner knows already and how much he has to learn in order to achieve some particular goal.

Gagne may appear to present a complex approach to the preparedness of the learner to achieve development. One could, on the other hand, take the view that his approach is entirely reasonable, for Gagne regards the development of intellect from his interactionist viewpoint. The teacher is charged with the responsibility of understanding the needs of the child in terms of his stage of development, and with supplying the "conditions of learning". The teacher's attitude should ensure that "the greatest change in the students' behaviour will occur in the shortest time" Gagne (1965).

Teachers may be hindered in their understanding of the concept of readiness if in their studies that have been directed to the reading of "cookbook" versions of the theories of Piaget e.g. Boyle (1969) and Furth (1969). Summaries of Piaget's theories as presented in these readers probably serve to

reinforce the traditional "ages and stages" explanation of intellectual development. While it is an unfortunate fact that Piaget (1954) used age ranges as estimates of normal development "phases", he did allow for individual variation. Flavell (1963) explains the fundamental theory of Piaget's epistemology:

"The cognising organism is at all levels a very, very active agent who always meets the environment well over half way, who actually constructs his world by assimilating it to schemes while accommodating those schemes to its constraints". (Page 18)

However, while Piaget appears to take an interactionist view of the learning process, he appears to regard the learner as being the more responsible agent in the educational situation. Bruner (1965), on the other hand, comes closer to Gagne's approach. In enunciating his now famous hypothesis: "We begin with the hypothesis that any subject can be taught effectively in some intellectually honest form to any child at any stage of development", Bruner stresses the importance of having the teacher understand the "child's way of learning things". The art of instruction as Bruner understands it, involves providing the growing child with problems that tempt him into the next stages of development.

The concept of "readiness" as it has become popularised seems to have become synonymously associated with the concept of readiness for reading. Numerous research studies have been directed towards the prediction of reading failure, it seems, since they attempt to measure deficits. Many of these studies

have been listed by Adelman and Feshbach (1971), who have pointed out that the relationships between predictors and criterion variables have been generally weak. Bateman (1966) and Wedell (1971) have also commented on the limited value of such studies in terms of prediction. LaCrosse (1970) notes that of fifteen reading readiness tests most frequently used, none has demonstrated long-range predictive validity. Thus it might be concluded that to know that a child is "ready to read" is not to say how he will read.

An astute observation on this lack of success is given by Lowell (1971) who reminds us that the factors in operation in the initial and subsequent testing might be quite different. Adelman and Feshbach (1971) appear to have this in mind in their discussion of "congruity". In rejecting the "readiness model", these authors assert that its emphasis is largely irrelevant in terms of assessing "key variables which interact in shaping school success and failure". They outline a total approach built on the understanding that the learning process (including learning to read) is complex. Among the conditions necessary for success, they propose, is the "congruity between a youngster's skills and behaviours (as manifest under representative classroom conditions) and these required of him in a specific Infant classroom".

On quite a different level is the work of researchers who attempt to find specific predictors of reading success. For example,

Lowell (1971) found that knowledge of alphabet names was an accurate predictor of reading success, and the only predictor, in his opinion, worthy of including in a reading readiness test. Lowell was also of the opinion that further replications of studies on reading readiness tests are simply not worth the expense.

Silberberg, Silberberg and Iverson (1972) attempted to prepare children for reading on the assumption that knowledge of letter names would hasten readiness to read. These experimenters taught letter names to middle-class Infant class children, but found that artificially introducing formalised instruction of letter names at an early age did not seem to have any permanent effect. They concluded that the Gesellian position of "differing maturational rates among children must be considered". Further, these authors question the value of training in other readiness tasks; and the value of pre-school training, if "end-of-first-year-reading is taken to be the appropriate criterion".

An answer to the puzzle of readiness to read may lie somewhere between the factors represented in these two pieces of research. There are qualitative differences between states of being familiar with, having rehearsed, verified, and received feedback from one's own personal knowledge, as against being subject to exposure to material for the purpose of learning it as taught, especially if the learner does not have the opportunity to transform the information into a meaningful structure. As a kind of academic retort,

Fowler (1971) successfully taught children with a mean chronological age of 4.2 years, to read, and reported their motivation to read and ability in reading had been maintained over the two-year follow-up. Perhaps the answer to teaching reading readiness is to teach reading!

One other area which has received considerable attention with regard to readiness and the identification and prediction of learning disabilities is verbal ability. As a general summary of the literature one could say that those researchers who set out to show that learning disorders of the populations under study were verbal at base have had their hypotheses confirmed. The main reason for this seems to be that many investigators have been guilty of taking the "deficit approach", an approach designed more to identify weaknesses than strengths, (Cazden, 1970); Riessman, 1964).

Martin Deutsch (1964, 1965) is the proponent of an idea he calls "accumulated environmental deficits". Hess and Shipman (1965) claim that the circumstances which surround the early development of the disadvantaged child are so constrictive as to "preclude a tendency for the child to reflect, to consider and choose among alternatives for speech and action". Whiteman and Deutsch (1967) believe they have described a "causal sequence", a developmental process whereby environmental factors manifest their handicapping effects upon later scholastic achievement. Jensen (1968) follows Bernstein (1960) in his belief that much of the language of the lower class "consist of a kind of incidental

emotional accompaniment to action here and now". The differences between the development of language by the two classes are seen to be important because of the intimate relationship between language and thought. The implication one may make from such a statement is that the lower classes never really learn to think. Hunt (1969) also stresses that the syntax of those from poor socio-economic milieux differs substantially from that of the "standard" language of the mainstream of society, and this poor language training fostered incompetence in the children of the poor.

That there are differences in the use of the English language is not disputed. However, what Stroufe (1970), Baratz (1970) and other workers question is the equation of differences with deficiency. Labov (1969) for example, asks concerning "standard" English:

"Is it true that all of the middle-class verbal habits
are functional and desirable in the school situation?"
(Page 202)

In other words, which style may legitimately be labelled "Deficient"?

Labov (1969) further asserts that there is no basis in social reality for the concept of verbal deprivation. This concept has been derived partly from testing situations without consideration of the fact that language used by the child in test situations is qualitatively different from spontaneous language used in natural settings, and that "the availability of a linguistic response in the child's repertoire does not guarantee its use whenever appropriate and helpful". Cazden (1969).

Sapir (1967) has expressed the view that "language is the communication par excellence in every known society", while Cohen,

Fraenkel and Brewer (1968) point out that a "language style ... identifies the insider and keeps the outsider out". Clearly, those educators who adhere to the Plowden (1967) statement that the "development of language is central to the educational process", need to take a sufficiently broad view of this policy that they make allowance for the problems of communication across different language systems or dialects, or what Cazden (1969) has called "inter-individual communication". In basing assumptions of such academic importance as "readiness to read" on the apparent development of language in the individual child, it should be kept in mind that it is still an open question whether dialect differences per se interfere with learning to read. Cazden (1969).

Language is commonly discussed as a system of rules and as a process of communication. The normal child learns both of these in his own culture and without formal instruction. He does this by imitation and exploration. Lewis (1969). The Communication which a child has with his world begins, as Lewis points out, as the interplay of tendencies, characteristic abilities and temperament with those of other people. This communication is at first non-verbal, and subsequently "communication gives birth to language" which then becomes its most important medium. In cases where there is a breakdown at this primary stage of the communication process, expressive language may not develop.

Language plays a part in structuring our experiences as it is organised on many levels almost simultaneously. Piaget (1973) maintains that the formative action of language on operations

"outdistances the language settings themselves", thus producing a disequilibrium from which will come further development, or a catching up, of the language function. In an experiment by Inhelder and Bruner (quoted in Piaget, 1973), the investigators found, "few connections between the two fields of verbal understanding and concrete reasoning, as though it were a question at this level of two different projects". Thus Piaget (1973) may conclude that "language probably remains less a necessary condition for the completion of logical structures".

In their studies on prediction of academic achievement, Meyers, Atwell and Orpet (1968) record the finding that amount of speech produced by the Infant class population did not predict any of the later achievement scores. Their best predictor test in the language area was the Expressive Picture Vocabulary, which required the child to use his comprehension and verbal abilities in a relevant and directed manner.

The results gained by Blank and Solomon (1969) by the use of time periods of three months, involving for each child, indirect tutoring for an optimum of nine hours, represent something of a revolution. What they have done is demonstrated that by harnessing the language skills already in operation, they were able to encourage the disadvantaged children to use their skills appropriately. Changes were also reported across a wide behavioural range including control of impulsivity, increase of attention span, and greater enjoyment in learning.

The evidence accumulated suggests that proof of ability or disability in language skills, as these are currently measured, may

be a poor indicator of "readiness" or of growth, i.e., of ability to develop strategies of learning. Thus Rutter (1971) reports that social withdrawal (as in elective mutism) is associated with a failure to use language but not a failure to understand language. As Blank and Solomon (1969) indicate, the kinds of measures most needed in this area are those which discern a growth in quality versus quantity of verbalisation, whereas most school and experimental methods focus on enlarging vocabulary for description and communication.

In conclusion, the picture which emerges concerning readiness is unclear, at least as far as the research evidence goes. The concept as used by teachers certainly lacks definition, and it is entirely possible that a reliable statement about someone else's "readiness" may be made only from hindsight.

B. APPROACHES, PROGRAMMES AND METHODS

In the area of early identification and remediation of learning disabilities, there appear to be three distinguishable but closely related modes of study and attack. For the purposes of this discussion they may be called "approaches", "programmes", and "methods".

Specialised clinics, in which teams work on a multi-disciplinary basis, rendering help to children and/or advising teachers, exemplify what is here called an "approach". A "programme" is the term applied to a specified series of events, not necessarily ordered. Just as a concert programme is a listing of discrete items, so the educational programme may be, and all too frequently, is. A "method" involves an orderly arrangement of events. In education it connotes sequentiality,

Examples of the "approach" mode are found in the work of Heckerl and Webb (1969), whose bias is educational, and Bannatyne (1968), who explains a "multi-track remediation approach". Perhaps the greatest advantage of this style of attack is that it permits the diagnostician to deal directly with "the programming disability of the adult rather than with the performing disability of the child" Lovitt (1967), though many of the clinics do both. Lovitt's point is extremely important, involving as it does the notion of matching, (Hunt, 1961). The mode requires not only collaborative skills in programming, but also great flexibility and versatility in the individual teacher. By using a team approach, scarce resources may be economically deployed, one benefit of this being that it is often possible to help a child help himself at the earliest



period. As Wedell (1970) points out, "such intervention may take very minimal forms". The costs of forming a clinic may appear to be high, depending upon the numbers of professional staff, but the long term savings in terms of children's futures, and of future expenditure on massive programmes of remediation or institutionalization may be beyond measure.

Heckerl and Webb (1969) found that their greatest successes with reading problems were with children at the lower levels, and concluded that special instruction "need not be delayed in the hope that developmental readiness alone will help the child to learn to read". In their study, the classroom teachers were deeply involved in the adjustments made on behalf of the students. This approach, which appears to be unusually thorough, involved the use of three principles. Firstly, it recognised children who were not learning by normal techniques and set out to discover "the different educationally significant needs of the children". Secondly, the diagnostic orientation was integrated with treatment procedures. Thirdly, an effective school programme was developed which provided special help and curriculum adjustments for as long as the child required them.

Another "approach" taken within a school district was that reported from Forth Worth, (1971, ED052550). In this

project the purpose initially was to determine whether "deviant" children (IQ 80) could be integrated into regular classrooms. Special assistance was given inside and outside the classroom. Most children who entered with IQ's under 80 were able to enter first grade classes. The three-year-old children made the greatest gains. The report stresses the importance of an early start for the sake of prevention so that motivation may not be hindered, and notes that the status of exceptional children can be changed if the prescription is effective. The "approaches" mode thus properly involves the use of "programmes" and also "methods".

The Heckerl and Webb (1969) study would appear to satisfy the conditions set out by Charters and Jones (1973), described as "levels of reality". By testing one's programme against these levels, it is possible for the investigator to certify that his work has value. The levels are: 1. Institutional commitment; 2. Structural context; 3. Role performance (staff perspective); and 4. Learning activities (pupil perspective). The study of Heckerl and Webb (1969) particularly appears to meet the conditions of professional responsibility outlined by Charters and Jones (1973) in that they used carefully devised measures of variables as "intermediate criteria" in lieu of simply using achievement test scores as the criterion variable.

Most children who may be eligible for early remediation, however, are not served via a clinic but by "programmes" of various kinds. One of the disadvantages of the studies involving "programmes" is that they very often have been administered to groups of children presumed to be at risk for learning disability by virtue of their poverty, as has been mentioned. Hence the heterogeneity of the groups serves to mask any effects, positive or negative, which a programme might have had on a genuine at risk population.

Examples of "programmes" as defined herein are: the Head Start and Follow Through programmes and the general run of traditional nursery school programmes. Specific examples are the highly structured pre-school programmes of Karnes, Hodgins and Teska (1968); Gray and Klaus's Early Training Project (1965); Weikart's Perry Pre-school Project (1967). Weikart (1967) has described these latter programmes in some detail.

Programmes are in general based on the idea of a curriculum guideline, which as Weikart and Lambie (1969) point out, is "designed for the teacher" by external experts, and the characteristics of the programmes are not necessarily related to local conditions. Silberberg and Silberberg (1969) lay the blame for this state of affairs at the feet of the God of Commerce, when they note that "publishing houses are one of the largest educational lobbies in Congress". Similar strictures may well

apply in the United Kingdom. At the schoolhouse door level, these authors point out, many curricula could be defined as the content of a textbook series, which means that curricula can be based on the relative skills of salesmen. Worse still is the fact that there is no logical and sensible development of the curriculum to meet children's changing needs and ways of learning, Plowden (1967) so that the preparation of the Infant School child is for an uncertain future. The Plowden Report of 1967 is worth quoting at this stage because of the straightforward manner in which the authors dealt out criticism. In describing a survey which had been made some years earlier, the Report said that as children went from the infant to the junior level, there is a

narrowing of opportunities, a tendency toward regimentation, a substitution of group or even class teaching for individual work. Many children tackled less difficult work and wrote less in their own words than they had done some months before. The libraries in the youngest junior classes were often inferior in quality and range to those the children had left behind in the top infant classes, and children spent more time on 'readers' and less on real books. Individual interests in music and art and craft had petered out". (Para 442, Page 163)

It is not surprising that children in compensatory programmes, trained to meet short term test criteria, fail to maintain their so-called "advantage" under these changing conditions. Silberberg and Silberberg (1969). They have not learned how to cope with the learning process.

Traditional nursery school practitioners support their curricula to recourse to children's "natural" activities. However, as Spodek (1970), points out, there is nothing natural about schools, and curricula cannot be directly derived from the natural activity of children. Dewey (1915) was also very critical of such an approach.

"The child is expected to "develop" this or that fact or truth out of his own mind. He is told to think things out, or work things out by himself, without being supplied any of the environing conditions which are requisite to start and guide thought. Nothing can be developed from nothing; nothing but the crude can be developed out of the crude - and this is what surely happens when we throw the child back upon his achieved self as a finality, and invite him to spin new truths of nature or of conduct out of that" (Page 18)

Gagne (1970) is even stronger in his criticism when he argues that "preference for a dependence upon unprogrammed experiences compatible with children's 'natural' interests can become a convenient rationalisation for not undertaking such a difficult job". The natural tendencies of the child, Gagne continues, are a poor guide to what he needs to learn. This may be particularly so for the children who have been seriously lacking in relevant experience.

The simplest and perhaps most forceful argument which can be made concerning the use of such programmes is statistical. If the general run of Infant School programmes, based on the use of "natural" childhood as the source of curricula, are

effective in their present mode, how is it that infant teachers identify approximately ten per cent of their charges as being at risk quite late in the year? An effective programme and an effective teacher would be sensitive to the needs of the individual child, and sufficiently flexible to have provided for them. It seems that the child at risk would not be capable of performing according to the standards of a developmental model which may exist in the mind of a teacher. The teacher's use of a generalised curriculum which simply samples the environment without guiding the child would fail to provide the means whereby the vertical transfer between varied experiences, basic to his development, may be enhanced. Gagne (1970).

It is not unknown for children at risk to be retained in the Infant Classes in the hope that they will "catch up". Apart from the obvious emotional dangers involved in confirming failure, merely increasing the duration of the exposure, Cronbach (1967) to the same inflexible curriculum cannot be supported on any logical grounds for children whose abilities are potentially normal. In the United States, Goodlad and Anderson (1963) report that upper grade achievement levels are higher in schools that have low nonpromotion rates. When "slow learners" are retained, they "express worry over their school progress, believe their parents to be similarly concerned, and frequently resort to cheating as a way of assuring higher achievement".

Valid arguments may be made to support the notion of developmental differences as they occur within any Infant School population ranging in age from 5.0 years to 5.11 years, and with mental ages which may range very broadly. This range of ages makes the use of programmes without consideration of what Adelman (1970), calls "congruity", suspect, to say the least.

Adelman (1970) espouses an "interactional view of the causes of learning problems". In his programme, children at risk for learning disabilities are identified by the teacher, who makes observations upon the interaction of the child with the characteristics of the ideal, effective classroom situation. Having identified the needs of the child, the teacher is then responsible for "personalising" the instruction. Adelman claims that teachers can learn how to arrange personalised programmes for classes of normal size.

Thus Adelman combines programming with method in attempting to deal with what Stott (1970) calls "faulty habits of learning" as they occur in the classroom. The important factor in this model arrangement is that it attempts to eliminate the slander of "deficit", and recognize the educational problem for what it is.

Examples of "methods" as identified in this discussion are those of Bereiter and Engelmann (1966), Montessori (1912), and Stott (1970). Bereiter and Engelmann (1966) developed

a strict system of direct instruction in language, reading and arithmetic. It would be difficult to justify the use of this method with children at risk for learning disability. Unresponsive and timid children, for example, may find the pressure to respond in a specified (and loud) manner offensive, if not threatening. The necessity to conform precisely and unquestioningly to the language and behavioural demands of the programme may result in displays of attention "behaviour" which are more apparent than real. "There is", says Dewey (1915), "all the difference in the world between having something to say and having to say something".

Tyson (1970) argues strongly that, as for meeting the educational needs of exceptional children, the inflexible system of drilling in so-called "facts" and "knowledge" may fail completely because it is aimed at comparatively less important or even irrelevant aspects of the problem.

Gagne (1974) has presented a description of "the functions served by instruction". There are four involved, and these may be conveniently used as a yardstick for comparing the usefulness or otherwise of the Bereiter-Engelmann programme. Gagne's (1974) four phases are:

1. Introductory, in which the stage is set for learning by appealing to student interest.

(Comment: It is assumed that work is self-motivating).

2. Guidance for initial learning phase, in which instruction supports the initial learning by giving directions, suggesting "coding schemes", furnishing prompts and hints.

(Comment: The system of direct instruction does not include learning by implication.)

The system of direct instruction stresses the use of "repetition and patterned responses" Bereiter and Engelmann (1966).

3. Application phase, concerned with schemes for retrieval and practice in generalizing.

(Comment: The learning of "facts" is presumed to meet the ultimate need of the students.)

4. Performance and feedback phase involves setting the occasions for student performance, and providing feedback relevant to that performance.

(Comment: Performance is prescribed and therefore cannot rightly be regarded as a performance, as described by Gagne.)

Gagne (1974) also discusses the importance of learning outcomes under the headings of: 1) verbal information, or knowledge; 2) intellectual skills; 3) cognitive strategies; 4) attitudes; and 5) motor skills. These capabilities, says Gagne, may be identified in any subjects of a curriculum. If we consider only one - cognitive strategies - in relation to the Bereiter-Engelmann programme, it quickly becomes clear that the outcome cannot be identified. The programme is not geared to

help the learner become increasingly skillful and independent. As Dearden (1968) suggested, the goal of education is "personal autonomy based upon reason". The Bereiter-Engelmann method does not seem to allow for either, on behalf of child or teacher.

Studies on the Montessori Method - Montessori (1912) have been reviewed by Meizitis (1971). The Montessori method, by contrast with that of Bereiter and Engelmann, stresses "self-education". According to Montessori, the child is an active learner whose drive for self development is sustained by an orderly but stimulating environment. Certain factors in the method would suggest that children who are learning disabled could profit from its application. The materials are carefully sequenced, and the order in which they are presented is set. The materials are also described as "self-correcting". Upon closer examination of the materials, and considering the problems which afflict the children under discussion in this study, one must doubt the usefulness of this method. For example, a child may make an error of judgement late in the completion of an item (say, the building of the pink tower). Few corrections are then needed, and these are easily perceived. If he made the error at the beginning of the task, however, several complicated manipulations may have to be made before the "correct" result could be obtained. This kind of task requirement runs the risk of reinforcing the negative self-evaluation of the impulsive child,

and of increasing the tendency of the withdrawn child towards further non-participation. Finally, the Montessori activities do not encourage the development of generalization in terms of problem solving. The arrangement of the curriculum appears to be horizontal. That is to say, the tasks which comprise the programme appear to be discrete and hence do not lend themselves to the development of "a hierarchy of higher-order principles". Gagne (1968).

Cronbach (1967) has stated the principle: "To systematize the process of adaptation, and hence reduce error, calls for a theory whose propositions would state the conditions of instruction best for pupils of certain types, both conditions and types being described in terms of fairly broad dimensions".

In considering the population at risk, Stott (1970) recognized that these children, by reason of their faulty learning behaviours, minimize their chances of success in the learning process, and constantly reinforce their responses in inappropriate directions. The Flying Start Learning to Learn Programme, Stott (1970) involves a methodical approach aimed at helping the child to maximize his chances of success. Stott worked on the knowledge that the average Infant class teacher will not be able to avail herself of training in special methods, some of which have been mentioned. The teacher may, however, be assisted by quite simple procedures to objectify her observations and so recognize faulty

learning behaviours in her class. The Flying Start method is designed principally to help the teacher modify these faulty approaches on the part of the children.

To this end, model learning situations have been designed which may have two major effects. One is that the teacher, by non-didactic means, is given new insights into the processes by which learning may come about. To use the method, she must adapt her own style of interaction with the child at risk, because the programme involves the use of games. These involve following certain rules, while modifying the conditions of play to suit the individual needs of the players. Koestler (1965) has discussed this process in terms of the "matrix" and the "code". For example, in playing chess, "your code is the rule of the game determining which moves are permitted, your matrix is the total of possible choices before you. Lastly, the choice of the actual move among the variety of permissible moves is a matter of strategy guided by the lie of the land - the 'environment' of other chess-men on the board".

The Flying Start differs radically from the Montessori and the Bereiter-Engelmann methods, which demand inflexible teaching performance and make no use of "fun". Use of peer interaction with the Flying Start also leaves the teacher free to act as observer and helper, thus modifying her authoritarian status from the child's point of view.

The other effect is that the child can experience instant and progressive success in situations which can be recognized as non-threatening. Moreover, these successful experiences may occur in a physical environment which has heretofore led to expectations of failure.

The method, in short, involves anticipating the occurrence of non-adaptive behaviours in learning situations, and supplying alternative situations to which both participants (or the participant) may respond in a positive manner. As a result, it is expected that, with the development of otherwise neglected learning strategies, maladaptive learning behaviours will be diminished. It will then be possible to make judgements and predictions concerning the abilities of the children in question.

C. THE USE OF GAMES IN CHILDREN'S LEARNING

"The autonomy of human wills and the diversity of human motives result in gamelike forms in all human interactions, and in this sense all history can be regarded as gamelike in nature" Abt (1971). Plato apparently saw this connection, Marrow (1956); Dearden (1968). He drew attention to the value of play and games in the education of the young in two of his works (Republic 536e; Laws 643c), pointing out that through the use of games the child's nature could be detected, so that educators could then decide into

which social class and role the child could be slotted and in which skills he could be trained. "Train them by a kind of game and you will be able to see more clearly the natural bent of each". (Republic 536e, Rouse Translation).

Apparently Plato's counsel went unheeded, for during the Hellenistic age games playing assumed a role subordinate to the serious business of learning to read. According to Marrow (1956), the manner in which reading was taught involved repetition, rewards and punishment. The seriousness with which the learning of reading and letters were treated (supplanting the traditional exercise time in the palaestra) is reminiscent of the extreme position taken on the current educational scene.

Whitehouse (1951) indicates that pieces of table games of an intellectual nature, similar to draughts, have been discovered in the Egyptian tombs of 1000-2000 BC. During the sixteenth century AD, draughts had become so widely known that a book on the game was published in France. In the years between the sixteenth and twentieth centuries, table games intended for the amusement and instruction of the young were numerous. Whitehouse (1951) offers examples of Geographical, Historical and Instructional Games, in which not only were the rudiments of the subject, e.g., arithmetic, infused, but those of moral values also.

However, most of the games reported in the collections would have been of interest primarily to the adults whose duty

it was to teach. Moreover, very young children were excluded from most reported activities, since these were cast well above the early school and pre-school levels. Indeed, one would have had to be both an excellent reader and exceedingly patient (and probably rather dull) to complete most of the activities reported. Here, for instance, is Move 81 of the game called "Arithmetical Pastime", from a collection printed in 1798, Whitehouse, (1951).

When the sun shines, the dial's shade
Shows the true time, nor ever lies.
Let truth your every word pervade
Clear as the sun, and you'll be wise.
If from the truth you've erred today
Stop thrice - if not, you need to stay.

Widespread concern for the use of games in elementary education did not appear until after 1900. Avedon and Sutton-Smith (1971) interpret the move as positive, and as being a response to man's continuing attempt to understand himself and his world. Games were no longer regarded as trivial concerns in the world of education.

There is a widespread belief in educational circles that suggests that time devoted to playing a game produces an amount of learning equivalent to the same time spent in classroom learning. Plato's assertion concerning the induction of individual skills or traits by the special use of games seems to be supported by modern experimentation on decision-making and on the sense of efficacy. Paradoxically, there appears to be no strong or consistent relationships between performance in a game and academic performance, which might suggest that the widespread belief referred to above is perhaps a myth. In recognising this apparent paradox,

Inbar and Stoll (1972) have suggested that for this reason games would be especially "valuable for the underachiever or the non-verbal or cognitively deprived student". If Inbar and Stoll are correct in this assumption, the programme designer for the average infant classroom may take good advantage of the information.

Abt (1971) has raised the question of using games in a diagnostic sense, for the identification of specific types of non-verbal abilities - cognitive problem-solving, social negotiating, organising, and communication skills. Games are invested with novel properties which increase the response levels of the subjects exposed to these properties. Sutton-Smith (1967).

The game as a "milieu for behaviour" may (potentially) provide a testing ground without occasioning too great a threat to the players, Goffman (1961). Perhaps the situation is similar to that described by Wallach and Kogan (1965) in which children under play conditions are able to ignore "stimulus bondedness". This seems to be the case with word games such as riddles and puns, as described by Opie and Opie (1973). For the pun, there is a code, Koestler (1965) of rules which must be followed, a "bisociation of a single phonetic form with two meanings", but the "matrix", or range of possible choices, are almost limitless in language games. It is likely that the manipulation of language for fun would stimulate development of reasoning skills along with language skills, since the game requires that the participants engage in an active mental "search".

In providing scope for the exercise of voluntary control on the part of the players, the game may also serve to develop the sense of a predictable and controllable environment, Coleman (1967). Inbar and Stoll (1972) argue that the evidence on this point is equivocal. Their argument, however, appears to be based on the assumption of a certain homogeneity in the structure and purpose of games. Nevertheless, Inbar and Stoll agree that the consequential feature of games, i.e., that they have specified consequences, is of great importance. They describe this feature as "autotelic". That is, the activity is self-motivating and can be enjoyed for its own sake. Much contemporary education, they argue, does not embody this feature. "The basic argument for school itself is financial or social reward; the argument for classroom performance is good grades", Inbar and Stoll (1972).

The element of motivation in the games approach would seem to be of importance. As Avedon and Sutton-Smith (1971) have indicated, educational research on the subject implies that games playing "produces better motivated learners rather than better learners, which perhaps suggests that it is the conations (strivings and determinations) in games that are their most important type of functioning". The point reflects again the wisdom of Plato's statement, which implies that through games all types of children may feel free to manifest their particular styles of responses, permitting a teacher to make assessments which otherwise may not be possible. This could be of value

especially in the case of withdrawn or apathetic students, Abt, (1971).

Russell (1966) and Kraft (1971) have raised the question of the intrinsic value of games which are taught to children. Both of these authors are concerned that education should prepare students for "intelligent participation in a free, open, and rich society", Kraft (1971). Russell (1966) has explained that games are essential in the development of the child's "will to power", without which the child would become "listless and lazy". However, the form which games increasingly take is that of teaching co-operation in its competitive form, which is the form "required in war, not in industry or in the right kind of social relations". Thus, the interpretation of Plato's optimistic approach must be tempered with some scepticism, since at least some of the consequences of the use of games will depend on the nature of the games involved.

It is possible that because a game may encompass a range of skills, Coleman (1967) or strategies, several persons may be playing the same game, that is, following the same rules, at different levels of skill. At the same time, all may experience a sense of efficacy, Boocock and Coleman (1966). This situation is not possible under the conditions of the traditional lesson, which does not offer a range of strategies, and demands a uniform level of performance.

The game in this way fulfils at least partly the conditions which Piaget describes as productive of equilibration through

self-regulation, Almy, Chittenden and Miller (1966). Children best achieve this end when given freedom to engage in a maximum of activity of their own, "directed by means of materials which permit their activities to be cognitively useful". For Almy (1959) the value of direct experience for the child lies in his involvement with his own experimentation and his own manipulation.

It is the unencumbered involvement and active participation of the child in games which permits him to focus his attention more effectively than is the case with other teacher devices, Coleman (1967). Thus the child may come closer to developing what Dewey (1915) has described as "true reflective attention", which leads him to develop a "habit of considering problems".

As a result of the child's involvement in the problem to hand, the teacher's role as "judge and jury", Coleman (1967) may be perceived by the child as being diminished. The necessary rules of discipline are inherent in the game, and these must be observed by the participants if they are to enjoy the interaction of the game, Abt (1971). The teacher by this means is released from the role of disciplinarian and instructor, and may coach the activity rather than evaluate it, Inbar and Stoll (1972), and observe from an objective position the functioning of his students. In this way, the teacher has the opportunity of identifying the superficially "backward" student, Abt (1971), and consequently of developing positive expectations in his regard.

Unfortunately, as Carlson (1968) has noted, the nature of games makes them vulnerable to abuse, particularly in the hands of inexperienced or lazy teachers. The game, designed with specific rules and objectives, requires study and preparation and careful groundwork by the "coach". Only after the procedure is established can the teacher withdraw to permit the self-teaching aspects intrinsic in the game come into effect. Even then, the "coach" is required as a constant influence and moderator in order that the participants should derive the planned maximum benefits from the exercise. It is too easy for the teacher in his use of games to become a victim of what Bruner (1966) has called "the fallacy of perfect obviousness", in which what presents itself to a theoretically sophisticated observer is there for all to see. Games require understanding and careful monitoring.

Since most academic games are designed for play by more than one person, peer teaching is facilitated. Understanding the principles involved in the game will be reinforced by the player's observations of his own and of his peer's moves. The co-operation required of the player permits the inclusion of error-checking moves, which will in turn contribute to learning.

The inter-relationships which exist between the players in the game settings are supported by the logic, "the definite end", which is the purpose of the game itself, Avedon and Sutton-Smith (1971). It is the encouragement of the development

of logical thought which should be the main concern of the designer of educational programmes, according to Almy, Chittenden and Miller (1966). Their evidence suggests that "faulty logic underlies many of the misconceptions of both older children and adults", which leads them to the conclusion that careful attention should be given to "whatever underpinnings of logical thought can be identified in the early childhood period."

The challenges presented by the problems involved in planning games force educators to become clear about their purpose in dealing with new problems and in seeing old problems from larger or different perspectives, Abt (1971). Theoretically this should encourage the development of superior teachers, since these would be forced to be far more analytical and lucid in their preparation than would usually be required. However, as mentioned previously, the inferior, lazy teacher may do damage to the process. Mishandled, the games method could readily produce chaos and frustration for all concerned.

Not only must the teacher be prepared for the game sequence, she must also be flexible in her analysis, and add to her repertoire, for games themselves sometimes elicit innovative and unanticipated approaches to problems. Each player brings to the game his own strategy, based on his individual past experiences. The extent to which he will further develop his strategies and logical structures through the medium of the game will depend to some extent on combinations of factors previously mentioned. The game must be so planned that the existing potential for the development of learning and strategies will be fostered.

CHAPTER 3

FORMATIVE EVALUATION OF THE FLYING START PROGRAMME

The formative evaluation of these materials was actually begun with the children in the Pilot group. It was with these children and while working in the classroom with the support of the teacher that the evaluator could plan alternative methods of use for the equipment. The age maturation of the particular children was found to be most important in determining the method of play with the various activities. The materials, as mentioned, had been developed with normal five year olds, so it was to be expected that variations in the method of play would be needed over broader age ranges.

In this chapter is given a fuller description of the games and of the methods of play developed over the course of the study.

A) Picture Puzzles

These are very simple pictures cut into 2 or 4 pieces as shown in Figures 4 and 5 . The instruction is to give the child one of the 4-piece puzzles and "let him make up the picture". If he fails to do this, it is suggested that the teacher teach the child how to work with a 2-piece puzzle by progressing through three easy stages as follows:

(1)/

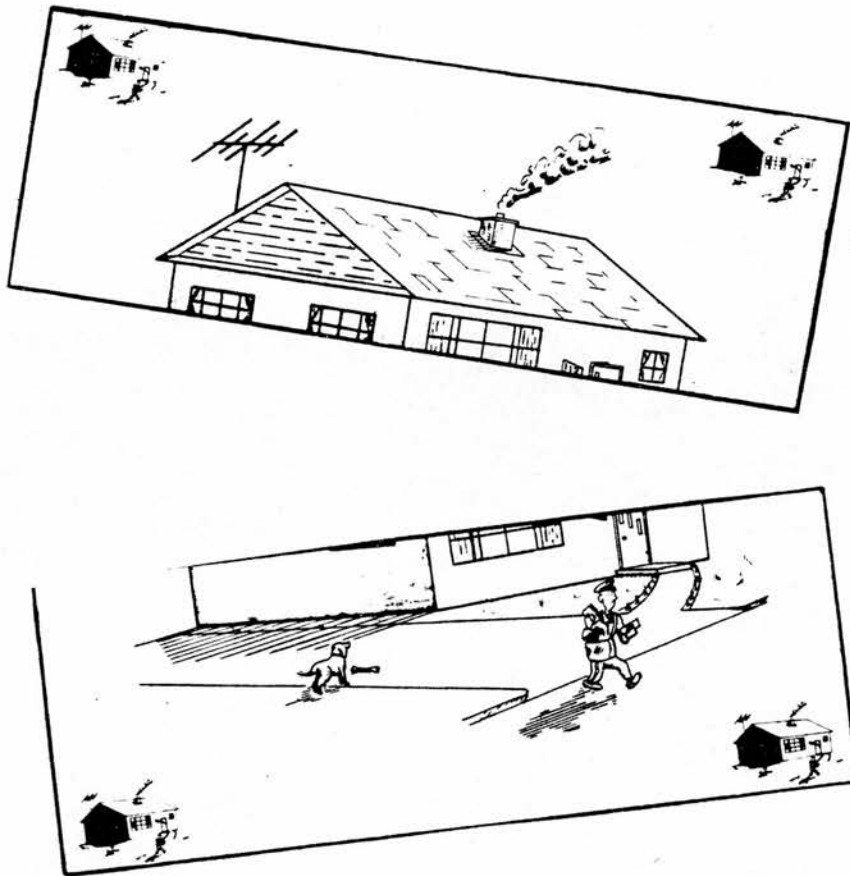
- (1) Take one of the pictures cut into two pieces only. Place on the table the half which gives the clearer indication of what the picture is about, i.e., the head of the person or animal. Place the other half a little distance away. Leave it there for the child to put into position. Give praise as he does so.
- (2) Repeat putting the second half a little further away.
Continue - putting the second half a little further away or at a greater angle each time. Praise each time the child succeeds.
- (3) Put down the first half as before, but hand the child the other half, saying something like, "here's the other part of the doll" (cow, etc.)
Once the child can join the two halves quickly and with confidence give him once again the same pictures in four pieces.

(Flying Start Learning-to-Learn Manual p.10)

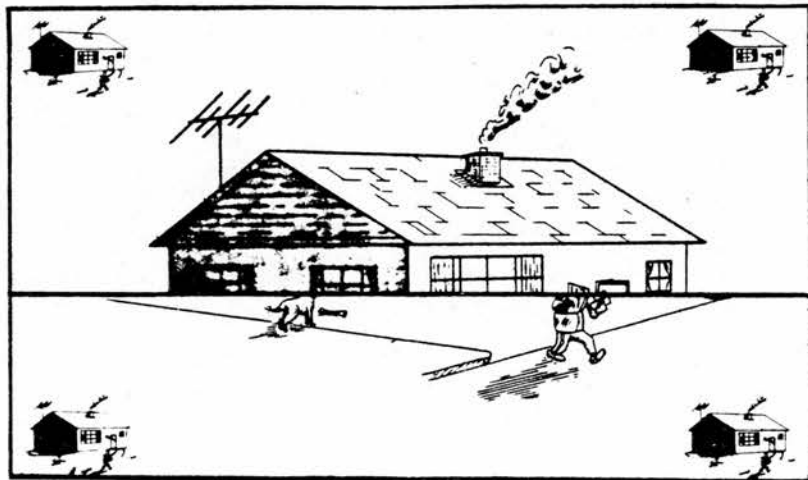
Discussion

Since the object of the exercise is to help the children to develop their learning strategies, it is most important that the first trial they experience is rewarded by success. It was found that a 2-piece puzzle presented in Position A (Figure 4) was the most acceptable, and offered the highest chances of success to beginners. Administratively, this was also easiest, since the teacher could keep track of her first interaction with all subjects, and the results were easily viewed over several subjects simultaneously.

If a child should fail to fit together 2 pieces of a puzzle presented in Position A, then further practice would be given, taking care that another picture was chosen. Most children, however find the solution to Position A very quickly. The second stage, Position B,



Position A for 2-piece puzzle



Position B for 2-piece puzzle

in which the same puzzle is presented with one half overlapping the other, would then be tried. This would normally constitute Trial 2. With a successful attack on Position B demonstrated, two or three 2-piece puzzles were presented, singly, in Position B, until the experimenter was assured that the child was performing expertly.

At this and every other stage, an attempt was made to assess the cultivated interests of the child and to meet these. For example, girls were given the doll, an animal or the house puzzles first, while boys were supplied with the truck, train, animal or soccer player puzzles.

As a final stage in training with the 2-piece puzzle, the child was handed the two pieces of a puzzle he had previously worked and told: "You can make a train (doll, cow, etc.) with these".

The same puzzle in 4 pieces was then presented in Position A (Figure 5). For most children this stage was simply achieved, but when children moved these pieces out of order, the completed 2-piece puzzle was placed near them as a model for copying.

Following the successful completion of Position A on the 4-piece puzzle, the child was presented with another puzzle in Position B (Figure 6). It was at this stage that errors began to become numerous, and that children began to show preferences for certain puzzles.

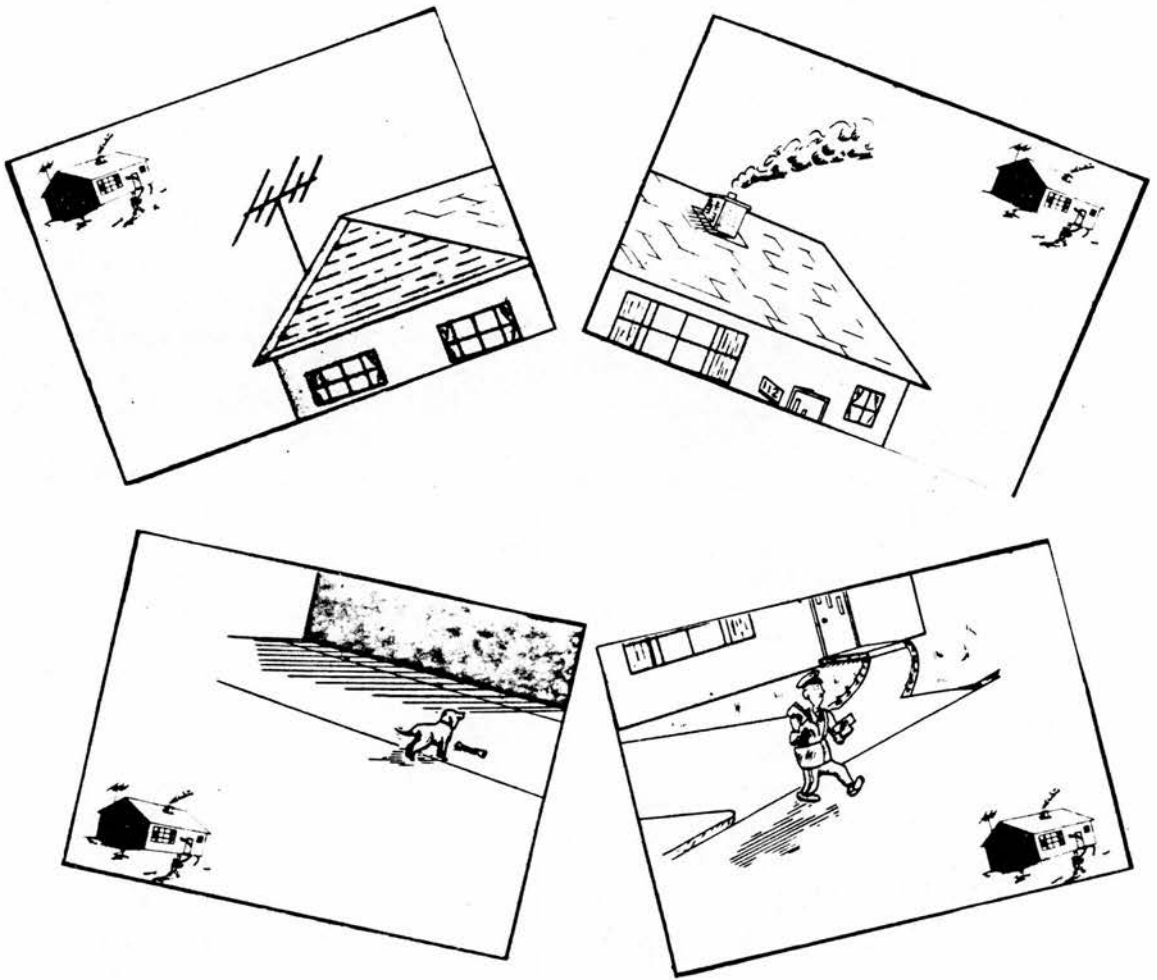


FIGURE 5

Position A for 4-piece puzzle

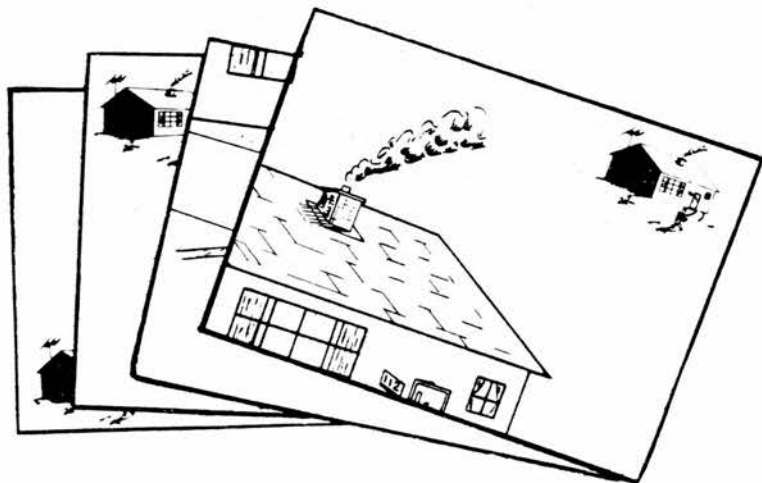


FIGURE 6

Position B for 4-piece puzzle

Some of the items caused problems for the very youngest of the children. For example, the cow and the train were particularly vulnerable to error. Frequent incorrect assemblies, as shown in Figure 7 (The cow), occurred in similar manner with the train puzzle. Some of the reasons for this may be based in the cultural backgrounds of the children in the study. Some of these young children did not know what the drawing of the train represented, and might be assumed never to have seen a train, living as they did in a rural community whose rail-service had been withdrawn in the 1960s.

The cow puzzle seemed to hold very little interest for most children in the study, whereas in the main, the white puzzles were received by nearly all children with great enthusiasm, and seemed to provide immediate motivational impetus for the development of their task strategies.

A problem which became evident was the distracting influence of the clues placed at each corner of the puzzles. A miniature of the main drawing had been printed on each corner of the white puzzles. It was sometimes found that if the attention of the child was drawn to these corners, he responded to the corner, using it as a dominating stimulus. Further, to say to the child that there "is a cow at each corner of the puzzle" before the corners were physically laid out, created a confusion which some children

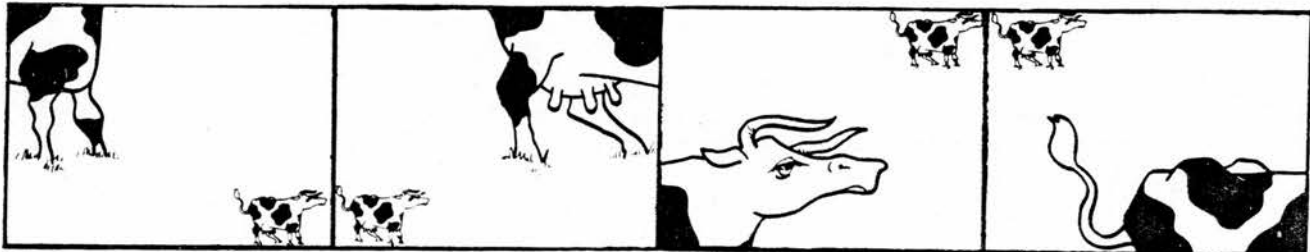
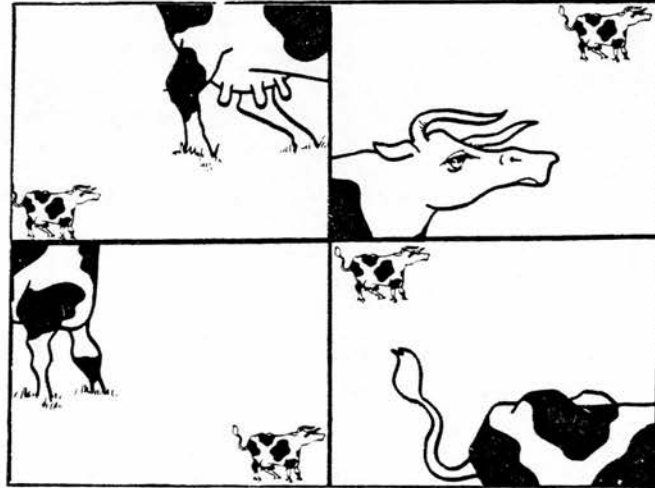


FIGURE 7 The Cow. Two Frequent incorrect assemblies from
Position B

had no way of expressing. In some cases, the children suffering this difficulty put all four pieces together into a square, as shown in Figure 7 . In others the stimulus of the corner became so powerful, that the miniatures were placed side by side, while the relevant features of the item were ignored. These two results, as suggested above, were most commonly found with the two least familiar figures. When one of these erroneous solutions was offered by a child, Position A was set up once more, so that the child was forced to centralize his attention, and to learn to ignore the corner clues.

Children who had originally experienced difficulty with the 4 piece white puzzles were given the set once more at the second session, at which stage the number of errors was almost zero, even for the youngest of the children.

The most popular of the white puzzles were the Christmas Tree, the Elephant, and the Truck.

B) Merry-go-Rounds

The description from the Manual is as follows:

Each of the puzzles consists of eight pieces which make a circle when fitted together.

Four of them have stars and four have dots. To make the pictures they have to be fitted alternately. (One child has the stars and the other the dots).

There are four stages, with three in each stage, in ascending order of difficulty.

Stage 1 (pink). All the star segments are identical and likewise the dot segments.

Stage 2 (green). Two of each are identical and two different.

Stage 3 (blue). All the star and all the dot pieces are different.

Stage 4 (yellow). The same, but the putting together of the children of different ethnic groups demands rather more discrimination (i.e. attention and withholding impulsive fitting).

(Flying Start Learning-to-Learn Manual p.13)

The Manual explains that the children are to be shown that four of the cards have stars, and four have dots. One child is then given the cards and permitted to deal them, so that he keeps one set and gives the others to his partner. The teacher explains that the children cannot fit their own cards, but must wait for the other child to place his. The teacher is instructed to intervene as little as possible in the playing of the game.

Discussion

All children in the study responded to these puzzles with great enthusiasm. It was this enthusiasm especially in the younger more impulsive children which led to the decision to plan the presentation of the items with greater care than a straight reading of the instructions might at first suggest. Careful initial instructions, it was found, assisted the children in moving smoothly through the more complex stages of this series, which is most effective in rapidly expanding the use of learning strategies.

The first game (pink card) needed no selection because all were identical. The strategy to be learned was a general organization of behaviour, i.e., controlling impulsivity in order to be

able to co-operate with another child in fitting the alternate pieces. Having learnt this, they were then freed, in the second game, with a 50-50 discrimination task, as has been described. It was found that some children would take all four pink (first set) cards in their hands and use them successfully as a deck. If, however, they carried this method over to the later sets, some of them experienced confusion and frustration because they could not clearly see the items for matching.

The children were trained instead to place all their cards in an array before them, so that all items were visible. (See Figure 8). The children were instructed to keep their hands away from the cards on the table so that they would not by chance cover the relevant item. Some of the younger children continually leant on the table, covering up the cards and scattering them. To prevent this from spoiling further games, these groups were taught a game called "Hands Up". In this game, the child first makes a move, then says: "Hands Up" and at his own signal, holds both hands up on either side of his head, while looking down at the table where the other child is making his play. This was a highly successful way of training the children in methods of concentration. On their turn to play, the children were instructed to search for the card which would "match the one in the middle". By these means, the training of irrelevant responses was avoided.

For some of the very young children, the concept of making a circle by using alternate pieces, which involved taking one's

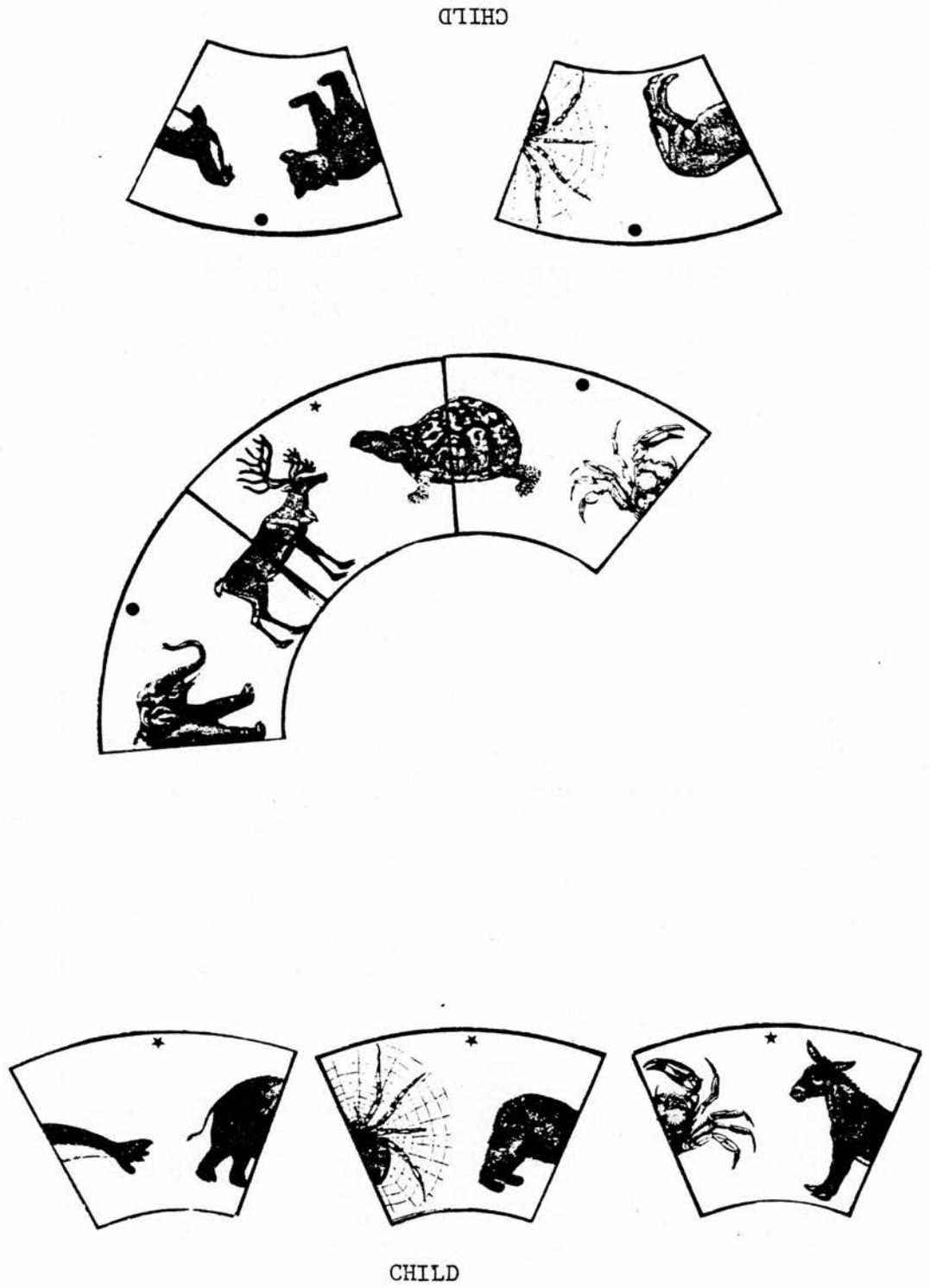


FIGURE 8

Merry-go-round : layout and method of Play

(This set also proved to be the most difficult)

turn, seemed initially to cause some confusion and frustration. This was especially so if one of the children tended to be impulsive and impatient. A visual aid was made to help at this first stage. The aid comprised a piece of cardboard of the same colour as the puzzle, on which a circle was described on the same scale as the intended completed puzzle. On this circle three or four arcs were marked off where the first cards might be placed. The arcs were also marked with the star and dot clues. (Figure 9).

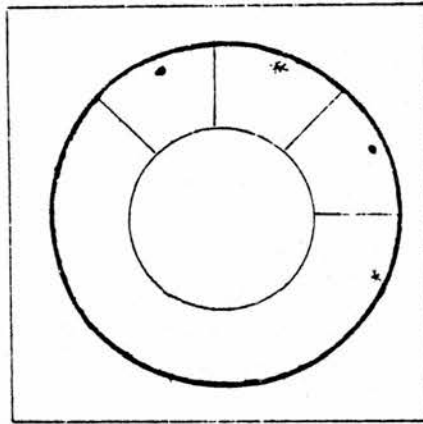


FIGURE 9 Visual Aid

This aid also found favour with some of the children who, wishing to work alone at some later stage, picked up a set of Merry-go-Rounds and a guide, and found they were able to concentrate well enough to scan all eight pieces without having their attention split between this selection process and the tricky step of forming the first quarter of the circle.

Some of the Merry-go-Round sets were more popular than others, and certain sex preferences came to light during the course of the pilot study and experiment. For example, some of the younger boys were only interested in those puzzles of the first and second sets which featured vehicles. Girls, on the other hand, seemed to tolerate any of the puzzles in the first two sets. Most interest, however, was shown by the girls in those puzzles which included kitchen utensils, furniture, and clothes.

In the last set, the animal puzzle (Figure 8) was the least popular with children of both sexes. The children appeared to find the donkey and the reindeer difficult to match and impossible to name. Many of them also showed open disgust and sometimes fear of the spider and the crab.

C) Mail Boxes

The directions for assembly and the description of the mail boxes is given in the Manual (p.11). The matching figures on the insides of the boxes are repeats of figures which the child has already met in other puzzles. (Figure 9a)

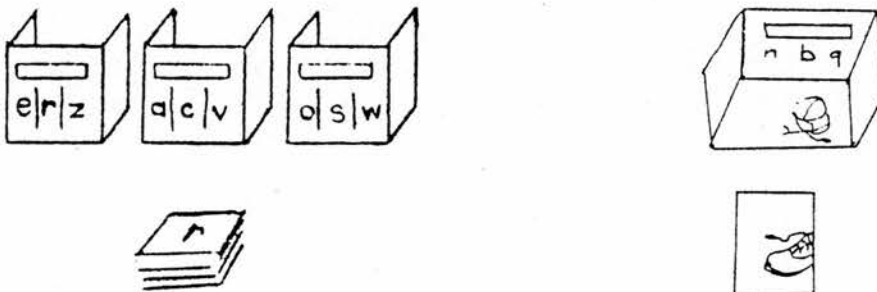


FIGURE 9a . Mail box and letter card, front and reverse.

The method of use is described as follows:

One child places the three Mail Boxes in a row with the letters facing the other player. The latter has the deck of letter cards. He turns them up one by one and mails them in the box bearing the corresponding letters. The first player checks them by matching the half-pictures on the backs of the cards against those of the floors of the boxes. If they tally he says "Right". If he notes a misplacing he says "Wrong" and returns the card.

(Flying Start Learning-to-Learn Manual p.12)

Discussion

This game drew immediate attention and interest from children in all groups. It is an activity in which one can be immediately effective since a single placement of a correct card may be interpreted as a complete act. In this sense the mail boxes differ from the other activities, and this may be one reason why so many children in the study would return briefly to the mail box games at later stages of the programme when they were seeking a change of activity.

Differences in the playing of the mail box games seemed to be related more to the basic styles of behaviour which the children exhibited than to age or level of maturation. Whereas the quieter withdrawn types of children were inclined to follow directions for posting and checking fairly closely, some of the more impulsive children would adopt alternative strategies which might not prove as satisfying or profitable in the long run.

The most common of these alternative strategies would follow when a "postman" noticed that the cards can be used by matching

either the fronts or the backs of the cards. To match by the back of the card, the child glances over the top of the mail box or through the mailing slot. This is normally done out of curiosity. The child may then begin to turn all his cards to the picture side and neglect the more demanding task of conducting a visual search for the correct letter on the outside of the mail box. The child has thus provided himself with an errorless strategy in dealing with the task. While such a course has its merits in that it indicates initiative and ensures success, the lack of challenge which the child soon experiences limits the breadth of interest which otherwise may be found in using the materials in a more controlled way. When children from any group were permitted to continue matching by the pictures it was found that they lost interest in this section of the programme. Measures were then taken to help them adopt more meaningful strategies

For younger children the mail box tops were covered so that the idea of searching for matches to the outsides of the boxes would become more apparent. They were also taught a method of withholding a trial and error response by checking the letter against each of the boxes, moving from left to right. This was highly successful with all groups and provided an excellent opportunity for the children to practice left-right methods of search, a good preliminary to reading. The children generally came, by means of this search, to look more closely at the alphabet letters and to name them when known. One draw-back consistently observed was that the cards

contained insufficient cues of the face side to enable children to determine which was "up" or "down". Each letter stood on a dotted line but this was sufficiently faint and this fact introduced another element into the situation which resulted in a greater number of errors. When some cue as to "right-side-up" was given, children proceeded confidently with the task.

The Manual suggests that the game may be made easier for very young children by taping over all but one of the letters on the front of each box. This method is momentarily effective, but most of the children in the study proved to respond better to the greater challenge of selecting between three letters.

At the other extreme, some children find that after a little practice, three boxes with nine letters present insufficient challenge. One such child gathered all nine boxes and cards from each stack, and without referring to the colour coding, made a L-R search along the whole row for each correct mail box. Several other children asked for and used six boxes at a time without error. At these times, two checkers were employed.

The role of the checker should also be considered. If, as the Manual instructs, the checker is taught to check by matching the pictures on the back of the card, there is a risk for the older child that the game may become uninteresting. The checker can be taught to watch for the correct letter, and he will find out incidentally that the pictures also match. It is then a matter of

choice on his part whether he prefers to use the simple picture clue or the more involved and challenging letters. Further, if the checker learns the picture-checking habit first, he may transfer this habit of response when his turn comes to be the postman, so that an efficient and profitable strategy might not be easily developed by this child on the Mail Boxes game.

D) Animal Puzzles

These are a development of the simple Picture Puzzles. They contain more pieces - progressing from six to ten - so that a strategy of looking ahead becomes increasingly more efficient compared with that of trial and error.

The segments are numbered on the backs to show the order in which they are to be placed before the puzzle is commenced. If the child cannot arrange the numbers in sequence a guide on a strip of card should be provided for him.

(Flying Start Learning-to-Learn Manual p.17)

To use the puzzles, the Manual instructs:

The child lays out the segments in a row face downwards in the order of the numbers, using the number guide if he does not know his numbers. He picks up segment No.1, then No.2 and fits them. He picks them up in order. He must not pick up the next piece until he has fitted the earlier numbers.

Show the child that the No.1 piece bears a picture of a monkey's head.

(Flying Start Learning-to-Learn Manual p.18)

Discussion

The animal puzzles were very popular with the children in the study. Most of the children showed delight upon being able to complete a large picture of an animal or bird.

Many of the children, being uncertain of their numerals, needed a number guide. When this was insufficient, a series of arrows (Figure 10) was added to teach the child the L-R direction he must use to achieve success with the cards. The children could be told to put the Monkey on Number 1 and to match the other numbers, then to turn over the Monkey first and follow the arrows.

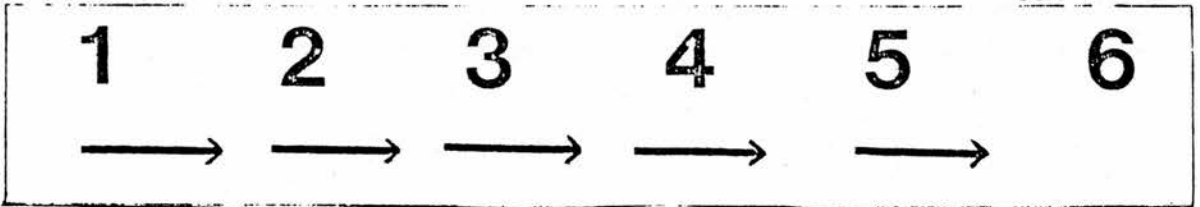


FIGURE 10

Number Guide

The presence of the Monkey's head on the back of Card 1 caused a certain amount of confusion with the very young children, who expected that the reverse side of every first card would show the Monkey puzzle. Because of this clue, it could not be determined whether the Monkey puzzle was the most popular or whether children simply confused the clue with the puzzle. It was an unnecessary confusion, because the numeral 1 is known first by most children, and causes them the least trouble. Also it was clear that even the youngest child could match the numeral 1.

Another clue to starting on each puzzle might have been a sign either unrelated to any of the solutions, or else each individual puzzle might have had its own meaningful sign, e.g., the Zebra head on the back of the Zebra puzzle.

There were three sets of animal puzzles:

pink - 6 pieces

yellow - 8 pieces

blue - 10 pieces

The first sets, the pink and the yellow, were preferred by the children in this study. Of these, the Monkey, Horse, Zebra and Elephant were most popular, while certain others were ignored by the children or used with some impatience. This response of frustration is understandable when very young children have become conditioned to an expectation of success with items that have little meaning to them when the same strategy does not result in success, at which stage irrelevant responses may be evoked and cause interference in the learning process.

It would be possible to avoid the occurrence of this unprofitable sequence of events by simply reducing the number of puzzles to which the less mature subjects were exposed. The younger ones, it was found, experienced more difficulty with the Squirrel and Duck puzzles, which may have been due to an increase of shading in these as compared with the sharp definition of the majority of the 6 and 8 piece puzzles, which they found most satisfying. It was clearly not a test of patience for even the youngest child to adopt the strategy of preparing the work by arranging the numbers and then to follow through by turning the six or eight cards in an orderly L-R sequence which led to the correct result. When it came to the 10-piece puzzles it was found that only those children who had shown their complete mastery of all problem solving situations presented were able to cope.

It was evident that most of the animals depicted in these advanced puzzles were unfamiliar to most of the children in the study. In addition, the work of laying out and putting together ten pieces of an unfamiliar object may have been sufficient to change this game into a chore.

One other problem of form was encountered in the series. Some of the puzzles (especially the 8-piece) were so made that by the time the seventh piece was placed, the animal shape was complete. Placing the eighth piece simply formed the rectangle. Some children showed confusion when handling puzzles with the blank pieces. They would sometimes sit with the last piece in their hands, turning the piece over, until shown where to place it. They had apparently achieved closure with the completion of the animal shape and without further training, they had no perception of the rectangular form, that is, of the puzzle as a board containing a picture. On all other materials in the Programme the children had made sense of items to be matched and fitted. In these other parts, as with most of the animal puzzles, the exclusion of one piece left the picture incomplete.

Children who suffered confusion with the blank last piece of the puzzles quickly saw the point of filling out the square when this was demonstrated to them, and they rarely needed help a second time on this problem. On the few occasions where children did not learn to perceive the periphery of the puzzles, a strategy-wise child from the group was teamed with the first child and requested to "take turns" with the placement of pieces. This method, of insinuating some mild competition

into the situation, was most successful.

The pairing of children on the animal puzzles was also useful where children needed training in concentrating on strict numerical selection of the pieces. A second child, waiting for his turn, would carefully guard against the other child's errors or short cuts, knowing that his own next move ran the risk of being spoiled if the first child did not play the game correctly.

The success of the animal puzzles might best be judged by the frequency with which the children chose to return to working with them. Children with free time were far more likely to select an animal puzzle for individual occupation than any other part of the Programme. As mentioned, this would always be a 6 or 8-piece puzzle, never a 10-piece puzzle.

E) What's Happening

This activity involves the putting together of parts of a scene in which something is happening. There are two sets of pictures. The first set of six puzzles are on white board and have four pieces each; the second set of six is basically yellow, with five pieces per puzzle. On the backs of the puzzle pieces are half-pictures of familiar items, as well as the numbers 1-4 or 1-5.

The child first lays out the pieces in a row face downwards from 1 to 4 or 5, checking on the sequence by matching the patterns. He then turns the cards over in strict numerical order. Having turned

card 1 and laid it on the table, he can see some part of a scene. He then turns card 2 and checks to find on which side of the first card to place card 2. He continues with 3, 4 (and 5) until the picture is complete.

Discussion

The What's Happening game (white set) was introduced to the experimental groups for a brief time during their third session. It was immediately, even dramatically successful. Supervised closely at first, and given number guides to be used where needed, the children quickly caught the spirit of the game, even where their withdrawn manner of behaving prevented them from being able to discuss the scenes. Highly verbal children and quietly reflective children were able to draw on quickly maturing and highly efficient strategies to solve the puzzles.

The What's Happening game requires the child to use a very flexible approach to problem solving in that the initial solution does not lead automatically to the conclusion. The turning over of card 1 gives only a clue to the content, a complex scene. Card 2 may become the solution for either the right or left of this scene, and so on with the remaining cards. In other words the child must move from the somewhat automatic use of numbers to the solution of a problem, the logic of which can only be revealed if the parts of the scene are correctly placed. This ordering of real life events appeared to have some strong effects on a few of the children in the

main study. Again, age did not appear to be of consequence. Two of the teachers in particular were sufficiently impressed by changes in certain children following the third session that they reported their observations to the evaluator.

Two problems were noticed in the use of this game. The first involved the combined clues of numbers and half-pictures on the backs of the cards. As Figure 11 shows, the use of picture clues plus numbers sometimes helped to defeat the purpose of Stage 1. Unless carefully checked and corrected, many of the children concentrated their attention on completing familiar outstanding items on the backs of the pictures. The number sequence was frequently neglected, and the children concerned had to be instructed anew and encouraged to use the number boards, so that they would ignore the irrelevant picture stimuli. Once this was achieved, the children were able to use the game quite properly. The picture clues are therefore unnecessary.

Secondly, two of the white sets of pictures were seen to be confusing to the children in the study. These were the Car Trailer (Figure 12) and the Airport Scene (Figure 13). The other scenes, i.e., Man with Dog, Dump Truck, Fire, and Fishing, were easily understood and enjoyed.

It is suspected that cultural and picture design factors are operating here. The children concerned lived near a main road where the traffic speeds by. Car trailers would be among the traffic, but these young children, previously so lacking in observational skills and in opportunities for discussion of the passing scene, may

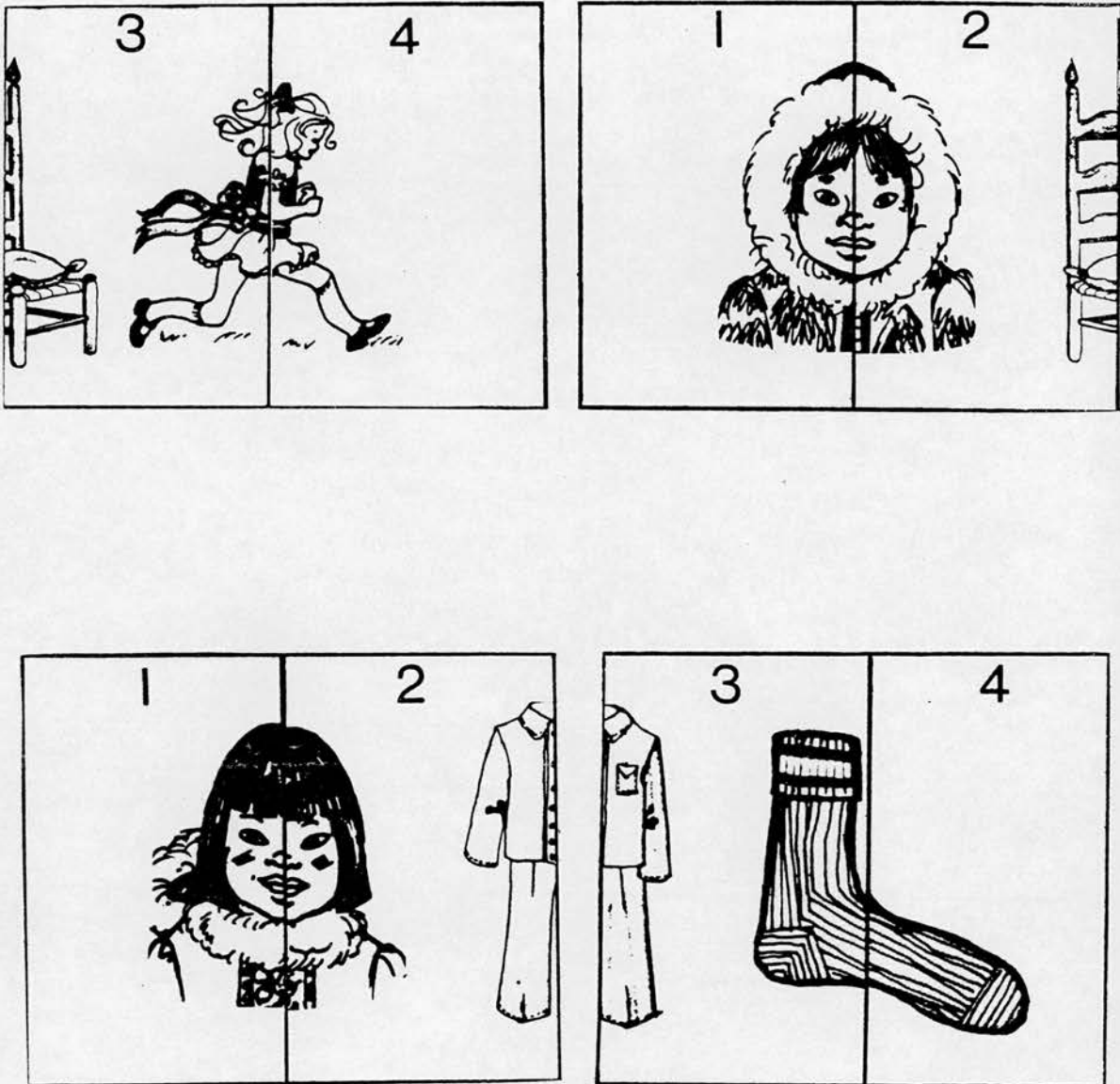


FIGURE 11 What's Happening, Stage 1

Showing centralising of attention on two outstanding items
and neglect of additional clues.



FIGURE 12

Common incorrect solution to "Car Trailer"
(What's Happening Stage 2)

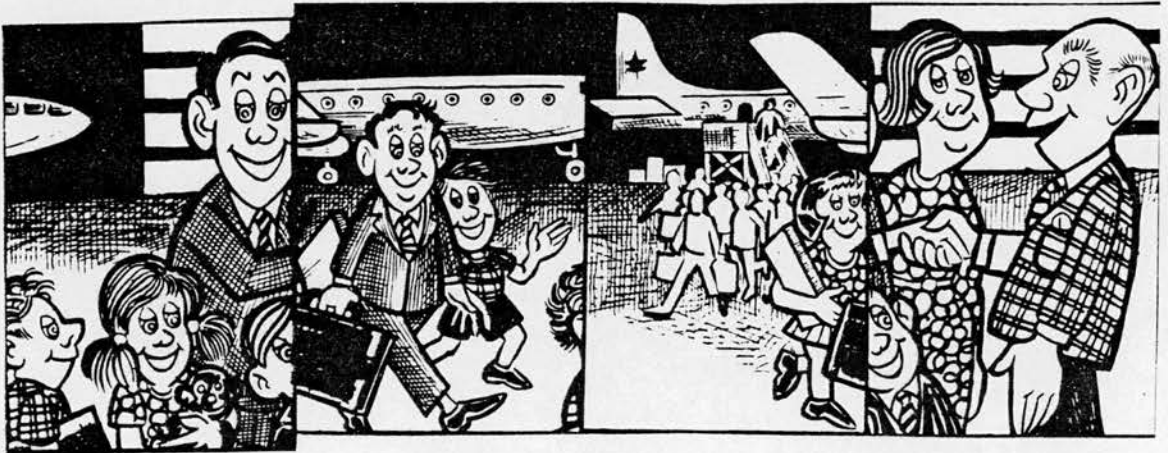


FIGURE 13

Common incorrect solution to "Airport Scene"
(What's Happening Stage 2)

never have noticed such a vehicle, and certainly not in a stationary position. Only one of the children questioned about this scene knew what it was. The Car Trailer scene is also very difficult to piece together because of the dark and complicated shadings, and because the truck has three sets of wheels, which the children found confusing.

The Airport Scene (Figure 13) was very seldom solved. It is likely that such a scene would be foreign to the children involved in the study. It seemed that both the background of the aeroplane and matching sky shading, and the foreground showing children were ignored, while the middle ground featuring adult figures was used in a most ineffective manner. One feature of this scene which may have added to the confusion is the way in which nearly all the people appear to be looking out of the picture, so that the intended centre of attraction (Grandfather) may not be viewed as central. It was possible to train the children to perceive the Airport Scene correctly, but few of them learned to succeed with the Car Trailer, and this puzzle was mostly left unused.

By the time the yellow puzzles were introduced, the children had all learned Stage 1 procedure, so that there were no initial problems with piecing the reverse sides of the puzzles together.

Two of the yellow scenes were poorly executed: the Christmas Tree scene, and the House Moving scene. For subjects possibly unfamiliar with either occurrence, these densely shaded drawings may have given insufficient clues by way of contrast. Other scenes - the Drowning Man, the Supermarket, and the Girl in the Boat - were

quite successful. The most appealing of the yellow series proved to be the Policeman giving a ticket for speeding.

As noted, it was directly after the first exposure to the What's Happening game that some striking changes were noticed in certain children. For this reason it is considered that the incorporation of the logical principles involved in this game are of prime importance to the success of the programme. The timing of the introduction of this part of the method may also be critical.

F) The Matchers

There are 15 Matchers sets, each consisting of a double series of six cards. Each series contains the same six variants of the picture but one series bears a small diagram of the holder to show that it is placed in the holder for matching.

The variations in the pictures follow a standard pattern. Three of the six have a major characteristic which is not present in the other three, for example the pirate's hat, or a girl smiling or not smiling. There is also a second differentiating characteristic, which in turn usually has a left-right variation, such as the pirate's wooden leg or the girl winking.

In the later series the same standard variations are applied to the discrimination of numerals and of certain letters of the alphabet, notably b and d.

The discriminatory tasks are not designed to be perceptually difficult. It is easy to see that some of the pirates have hats and others do not, and so on. Nevertheless, some of the later series, such as those of the lions and the shields, do involve fine discrimination, but only after the child has been trained in what to look for.

On the backs of the cards is a checking device of a varying number of black bars. Each identical pair of cards had the same number of these bars.

(Flying Start Learning-to-Learn Manual p.19)

The Method of Use is described as follows:

For children capable of conducting their own game the following basic procedure is recommended.

Two players sit face to face across a table. Each has a holding frame, in which he places a set of six pictures. This should be one which has a small diagram of the full holding frame on the backs of the cards.

Each gives the duplicate set, without the diagrams, to the other player. Player A passes one of the duplicate pictures to player B. Player B has then to find the matching card from his set of six.

He takes it out of the holder and turns the two cards over to see if the bars on their backs tally. If they do, he has made a correct choice, and he may keep the card. If not, he must hand it back.

In either case, the card with the diagram is replaced in the holder, so that, in all subsequent choices, there are six cards to choose from.

Player B then passes a card to Player A, and the procedure is repeated. The game ends when one player has won all his six cards.

Each player has to stick to his choice, that is to say, the card that he touches.

(Flying Start Learning-to-Learn Manual p.20)

Discussion

There is no doubt that the Matchers game is the most challenging of all the Flying Start activities. The game was designed "primarily to condition the Inconsequential child to withhold his choice until he has carried out the correct series of comparisons and checks".

In the pilot study it soon became obvious that the game would have to be developed by stages before these children could benefit from its use. The most basic method of shaping the desired behaviour

of the children was introduced. One card from a set was placed before the child, who was told: "This is your card". Then two other cards, one a match of the child's card, were placed a little further away (Figure 14). The child was told: "These are my cards. One of mine is the same as yours. If you find it, you can keep it". The child selected one of the two and checked both the front and the backs of the cards. If he was wrong, he had to return the card. Two of the three cards were returned to the bottom of the pack which had been specially sorted beforehand. Those retarded children who were introduced to this game were quite capable of playing and eager to use the earlier sets. The more advanced sets, e.g., lion, were not introduced, since such fine discriminations would have presented insurmountable problems to the many children with poor eyesight in these classes.

Provided that the sets were prepared in advance, most of the Infant Class children could enjoy this game in pairs, and they were able to progress through stages in which their choices had to be made between 3, 4, 5, and finally 6 different cards. By this time the principles involved in the set had been learned with comparative ease, and the idea of challenge had been accepted as part of the fun of the game.

Children who learned to play the Matchers in this way would often set their own standards for commencing another set. With a flexible approach to the game, it was possible to permit children to choose between using an array of two pictures as in Figure 14, or to extend the array as far as the ultimate six. By this method the



FIGURE 14

Matchers

younger children could be trained to play the game in its most complicated form.

Only one child, in the whole study, however was sufficiently advanced to complete the 15 sets. This was not considered of great importance since the principles of multiple comparisons were involved in all sets. The most popular sets were: the Pirate, the Girl, the Donkey, the Letter sets and the Number set. Those selected the least number of times were: the House, the Cottage, the Lion and the Cowboy.

Conclusion

The instructions for the experimental version of the Flying Start, having been written from experience with five-year-old children, were found to need some modifications during the course of this evaluation. The design of the materials was such that variations on the method of presentation could be accommodated, so that younger (4-5 year old) children were able to profit from their experiences by improving their learning strategies.

Modifications made during the evaluation were seen to improve the use of the Flying Start, and it was felt that the expansion of the instructions as worked out would be of value for future teachers who may use the revised version of the programme. The impression gained by the evaluator was that most children who experienced this programme improved their learning strategies.

Most of the suggestions for change formulated during this experiment have since been incorporated into the latest Manual and kit which is now the commercially available version. The suggested improvement to the face of the mailbox cards to indicate "up" and "down" has not been incorporated. Reports continue to suggest that this modification is long overdue.

CHAPTER 4

EVALUATION OF THE GUIDE

In the view of the writer, it was important to evaluate the Guide to the Child's Behaviour in the Learning Situation. Throughout the Autumn and Spring Terms of session 1974-75 the writer invited a number of experienced teachers who were all attending an In-Service Course at Moray House College of Education, Edinburgh to try out an experimental form of the Guide and report. The following represents a report on that exercise.

A. Purpose and Use of the Guide

The Guide to the Child's Behaviour in the Learning Situation was developed by D.H. Stott and has been discussed elsewhere (Stott, 1971). At the time of its use for the present evaluation it was in its first experimental form, though its base, the Bristol Social-Adjustment Guides 1972, had become standardised.

Briefly, the Guide is a form addressed to teachers for the evaluation of faulty styles of learning in children. As in the Bristol Guide, two main categories or types of children are delineated : the shy, withdrawn or lethargic child; and the hyperactive, distractible or impulsive child. From the Guide one is able to draw a profile of the child's faulty behaviour in the learning situation. The profile is given in terms of degrees of severity as the example on the following page shows.

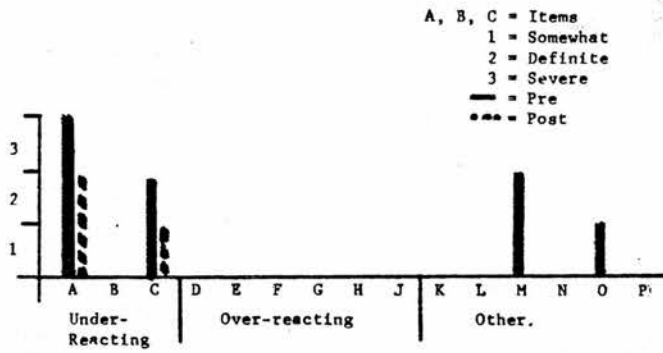


FIGURE 15 Example of a profile from the Guide

The experimental form of the Guide which was the subject of the following analysis is reproduced as Appendix A.

B. Analysis of the Guide

An analysis of the Guide in the light of experienced teachers' observations is most conveniently done by section, following the structure of the instrument. The opening instruction, however, calls for some preliminary comment. The underlined instruction reads:

"This Guide is designed rather like a census form. Where you go onto next depends on how you answer each question. You may check more than one box in each section. Start with Section 1".

Some teachers argued that the statements conflicted in that they contained conditional and unconditional elements. Some teachers did not read the statement until it was pointed out to them, after they had asked how many boxes could be checked.

The front page seems to be quite overcrowded. In such a case, novel configurations such as the boxes would draw attention away from more common signs, such as statements of introduction.

The list of criteria in Section 1 also call for some scrutiny. All but one of the seven criteria were easily understood by teachers. The exception was the negative statement : "Does not permit himself unnecessary distractions". Problems arose here where teachers had chosen to answer the other statements in a "Yes/No" fashion, which made responding to the above statement difficult.

With regard to these criteria, it was often necessary to explain to a teacher that she was expected to be considering a particular child in relation to the other members of the class. When thinking about certain children, some teachers would fail to compare the child in question with the reasonably normal children on whom they might base their generalisations. Teachers would, for example, say: "Attends and concentrates well", by adding "for him"; or "Does what he is supposed to do", by adding "Is getting better".

In other words, teachers often had to be coached in objectivity before they were able to complete this section to their own satisfaction. In using the Guide in the Main Study, it was planned that a preliminary statement of explanation would help to eliminate some of the unnecessary confusion.

Following the criteria are two instructions which the teachers often found conflicting. They are -

"If you can confidently check all seven of the above,
don't go further"

and

"If the above seven generally apply but you think the
following applies also, check it, but don't go further".

The teachers argued that there was no point to the instruction : "don't go further" when one was invited in the next sentence to check yet another statement. Several of the teachers also remarked that this second statement was of no use to them in any event, and suggested that it should be omitted. Omitting this lengthy and little used statement would also free some space to allow a neater structure for the last part of Section 1.

In the first part of Section 1 the instructions seem to call for a categorisation of the child in terms of his behaviour, except that the final statement provides an escape from this action.

"If you can check neither 'Yes' or 'No' because the child is sometimes one or the other, or of an even temperament, go on to H and J on page 4, and then to Section IV, (pages 5 and 6)"

This last sentence, however, was seldom read. The teachers usually checked one or the other of the categories, and sometimes both, if they regarded the child as a "mixed" type. When asked for an opinion on this point, they were advised to work through the whole form, since their reasons for being unable to make decisions were not available.

Again, in the Main Study, an instruction to read through the Guide before marking anything was found to be helpful at this point in order to assist the decision making process of the teachers as they attempt to consider all the statements. Otherwise, there is no way of allowing for the fact that, having become more familiar with the form, the teachers are more able to check off behaviours for those cases which are dealt with at later stages of their referral processes.

Another point of interest was that some teachers hesitated to classify children in either the "impulsive" or "nervous" categories because they interpreted the statements as being inclusive. That is, the term "impulsive, hyperactive or distractible" was sometimes understood as "impulsive and hyperactive and distractible".

Section II was generally well understood by the teachers. There are three items in this section, dealing with the nervous, timid, withdrawn or lethargic child.

Section III was treated in a straightforward manner for the most part. This applied particularly to items D, E and F. Item J ("Tries to be clever in an unhelpful way") warrants some discussion. The use of the term "unhelpful" probably caused some teachers to neglect the item. If the expression was not understood, then the teacher would almost certainly respond in the negative. The impression gained from some of the teachers was that they were considering the question in an either/or fashion, which may have prevented them from making a clear interpretation of the other parts of the item.

Section IV proved quite difficult for the teachers. One of the reasons may be that the respondent finds here a conglomerate of seemingly disparate items, immediately following two neatly prescribed sections.

Item K ("Doesn't check his errors") would be difficult for the average teacher to analyse in terms of its basis, i.e. depression.

The connection between the item headline and the severe rating description : "You cannot stir him to take any interest" is not at all clear, and may account for the fact that in the preliminary study, this severe rating was checked only once.

Another point relates to Item L. Descriptions of behaviours were phrased in the masculine, whereas the feminine is used for Item L. Stott (1971) explains that the behaviour under this heading, i.e. "Relies on personal charm to avoid learning" is the counterpart of the boy's compensatory behaviour described under Item J : "Tries to be clever in an unhelpful way". In this case, one would question the inclusion of both items without explanation. It might also be expected that Item L would be checked mainly for girls.

The description which accompanies Item N may also bear looking into, especially the phrases used for the "Definite" and "Severe" ranges. The statements: "Loses his power of concentration very quickly"; "Concentration is not maintained for more than a brief moment" are open to gross misinterpretation. A subjective view of the child's ability to concentrate is very often given by teachers in descriptions of behaviours.

Finally, Items O and P need to be considered. Item O: "Doesn't seem aware of what the task calls for" should be checked, according to Stott (1971) "only after a long period of patient observation" and "only after we are convinced that none of the temperamental handicaps apply". Children who are checked for Item O may be operating at the retarded level (Stott, 1971). One

would therefore expect that children who scored on Item O would not be checked on Item P, especially at the Severe level: "Obviously has good ability but refuses to apply it to the routines of learning so that his achievement is very poor". The fact that this occurred in the preliminary study in two cases (Robin and Angus) suggests the need for further revision of these particular item descriptions to prevent further confusion.

On the basis of these discussions, a number of changes were made to the Guide. These changes sought to improve the format; clarify some of the behavioural categories by extending the descriptions and allow for possible transcription to punch cards. This revised Guide is reproduced as Appendix B and is the form that was used in the main study.

C. Reliability of the Guide

The Guide in its experimental form was developed as an observational schedule to be completed by teachers in respect of children considered to have learning difficulties. The origin of the 15 categories of descriptions of the inappropriate behaviour arises directly out of the observations conducted over several years at the Centre for Educational Disabilities, University of Guelph, Ontario, Canada - of the learning (or non learning) habits of 5-6 year old children. This work is reported in Stott (1971) and Stott and Morgan (1975). Experience of the use of the Guide by Stott and his colleagues and by the present writer has shown that the Guide is

acceptable to teachers -

- a) because they are not asked to make ratings on a simple linear scale but to choose a description which suits the child.
- b) because the descriptions are strictly of observed behaviour and do not call for teacher interpretation.
- c) because the descriptions are in language that teachers would use professionally in describing children's learning styles.

Because the Guide is used in the restricted context of seeking to describe only those children presenting inappropriate learning behaviours it follows that only such a "clinical population" would be defined by the schedule - thus no normative data are available. Indeed there are little published data available in respect of the Guide. No index of reliability is reported in the literature (as far as the writer has been able to ascertain); Morgan (1975) is reported in Stott and Morgan (1975) as having demonstrated a degree of validity of the Guide under regular classroom conditions by comparing teachers' general expectations of their pupils' (first year infants) progress as recorded on a four-point scale ranging from "very good teacher prognosis" to "poor teacher prognosis. Morgan reports that good agreement was registered between the learning style as identified and the teachers' general expectations with regard to the child and that all the types of inappropriate cognitive style described in the Guide agreed with teachers' perception of what was

likely to make for failure.

The present writer takes the view that the value of the Guide as an instrument is diminished by the lack of any data relating to its reliability. From the Main Study of this research it is possible to offer some tentative data in respect of this omission. The Main Study comprised an experimental group (n=17) and a control group (n=17) in respect of whom the Guide was administered in a pre- and post-test design. By subjecting the control group data to analysis by calculating a Category Reliability coefficient a crude index of the Guide's reliability is obtained. These reliability coefficients were calculated for each of the 15 categories in the Guide by working out the proportion of coincidences of recorded category observations pre- and post-test, over and above the random expectation. These reliability coefficients are indicated in Table 1.

Bearing in mind all the caveats about inferences from small samples etc. these reliability coefficients offer some grounds for confidence in the Guide as a reliable instrument to use in the attempts to describe inappropriate learning behaviours. The use of the Guide in this study for the purposes described may itself be taken as part of the process of validation of the instrument necessary before offering it to the teaching and related professions as a valid and reliable schedule. The writer remains only too well aware of the fact that what is reported here only meets in part the requirements of rigorous analysis of reliability and validity.

Guide Category	Reliability Coefficient
Category A (Afraid to begin)	0.44
Category B (Assumes dull role)	0.64
Category C (Solitary ways)	0.57
Category D (Impulsive)	0.44
Category E (Does not concentrate)	0.52
Category F (Over-active)	0.61
Category G (Mad)	no data available
Category H (Ways of evading)	0.49
Category J (Clever in an unhelpful way)	0.76*
Category K (Doesn't check)	0.43
Category L (Relies on charm)	0.43*
Category M (Hostile)	0.61
Category N (Loss of concentration)	0.42
Category O (Seems not aware)	0.66*
Category P (Insists on own way)	0.64

* each of these categories had small numbers of observations recorded.

TABLE 1 Reliability coefficients for each of the 15
Categories Calculated on the Control Group (n=17)
pre- and post-test.

CHAPTER 5

THE PILOT STUDY

This Chapter describes a pilot study that was carried out preliminary to the Main Study. In this preliminary study various measures were tried out, the investigator gained valuable experience in working with children "at risk" for learning difficulties and in addition was able to foresee problems that might have arisen in the Main Study.

A. THE PRELIMINARY STUDY

Throughout the Autumn Term (1974) contact was made with three primary schools and their respective Infant Teachers with a view to trying out: a) the Guide; b) the Flying Start materials; c) a battery of assessments. The intended plan was for the experimenter (the writer) to work with selected children from each class throughout the Spring Term (1975) for a period of 10-12 weeks.

The classrooms were visited by the experimenter on several occasions, so that the children could become used to the stranger. Also, the experimenter had several sessions with each individual teacher, discussing the Guide, its completion and the proposed introduction of the Flying Start materials into the classroom. The support and encouragement of teachers was readily given. A number of factors outwith the experimenter's control interrupted the planned preliminary study. By coincidence, one school was selected for a project being directed by a colleague of the writer and it was felt advisable not to overintensify the research activity.

A second school was badly disrupted by the industrial action of teachers in November/December 1974. This left the third school - an open-plan, single stream Primary School catering for a wide social mix - as the only school in which the present preliminary work was carried out. This was carried out with a Primary 1 Class (n=29). The class teacher after discussion was invited to fill in the Guide to the Child's Learning Behaviour which incorporated some of the changes suggested by the In-Service group referred to above. From this, five children were identified by the experimenter as being "at risk". The criterion of "at risk" for learning disability is held by the experimenter to be: 'those children who scored one or more "severe" signs, or two or more "definité" signs'. The class teacher was invited to nominate those children in the group for whom she felt concerned and who might present a poor prognosis in educational terms. She nominated six, including the five identified by the experimenter from the CLB profiles together with another child whom the experimenter considered to be a marginal case. (This child left the school at a later date). The behaviour profiles for each of these children are contained in the Case Studies below. For the purposes of preliminary study, the experimenter worked with these five children.

In the present case children at risk for learning disabilities were identified by means of a behaviour checklist by which the class teacher indicated the extent to which faulty learning strategies were interfering with progress in the classroom.

Central to the final study is the hypothesis that a group of such children who experienced the Flying Start materials would significantly alter their problem solving approaches as compared with other groups. This change would be reflected in significantly improved behaviour profiles as recorded by teachers. It will be important to remember in the Main Study that the analysis of these changes in behaviour would be required in terms of inter and intra-group improvements since the Guide allows of a classification of children into two general types viz Under- and Over-Reacting Behaviours. Hence it will be important to investigate the effects of the experimental programme on different styles of faulty learning behaviours.

The writer refers to the central hypothesis above: viz problem solving approaches will be altered. At this stage of preliminary investigation, the experimenter was concerned with the problem of assessing such problem solving approaches. It is held that standardised test scores cannot supply the information required for a detailed and on-going analysis of change in learning behaviours, since children will manifest precisely the same inappropriate styles there as they do in the learning situation. An attempt was made, however, to use the standard testing situation for gathering information concerning modes of attack in the problem solving situations as these were observable in the pre- and post-testing sessions. These measures are now outlined.

B. THE MEASURES

As has been described in the previous section, the Guide to the Child's Learning Behaviour was completed by the teacher and was used as the basis for identifying the "at risk" children. In addition the experimenter administered a number of psychometric procedures. The teacher - completed Guide together with the experimenter - administered procedures were used for the collection of both pre and post experimental data.

Three non-verbal tests were chosen on the expectation that at least some of the subjects would be unable to respond verbally in testing situations. The actions of pointing, drawing and manipulating a toy would present, it was hoped, less threatening situations to the children generally. With some freedom in the response situation (i.e., no pressure to verbalise), more accurate measures of their capabilities on the tests and on their individual response styles, and of the changes in the latter, would be available for study.

The three tests selected were:

1. The Porteus Maze Test - Vineland Revision (Porteus 1959)
2. The Coloured Progressive Matrices - Forms A and Ab
(Raven 1965)
3. The Animal House subtest from the Wechsler Pre-School and
Primary Scale of Intelligence (Wechsler, 1963)

1. The Porteus Maze Test was first described by Porteus in 1914 at the overseas meeting of the British Association for the Advancement of Science in Melbourne, Australia. Currently the test has three forms,

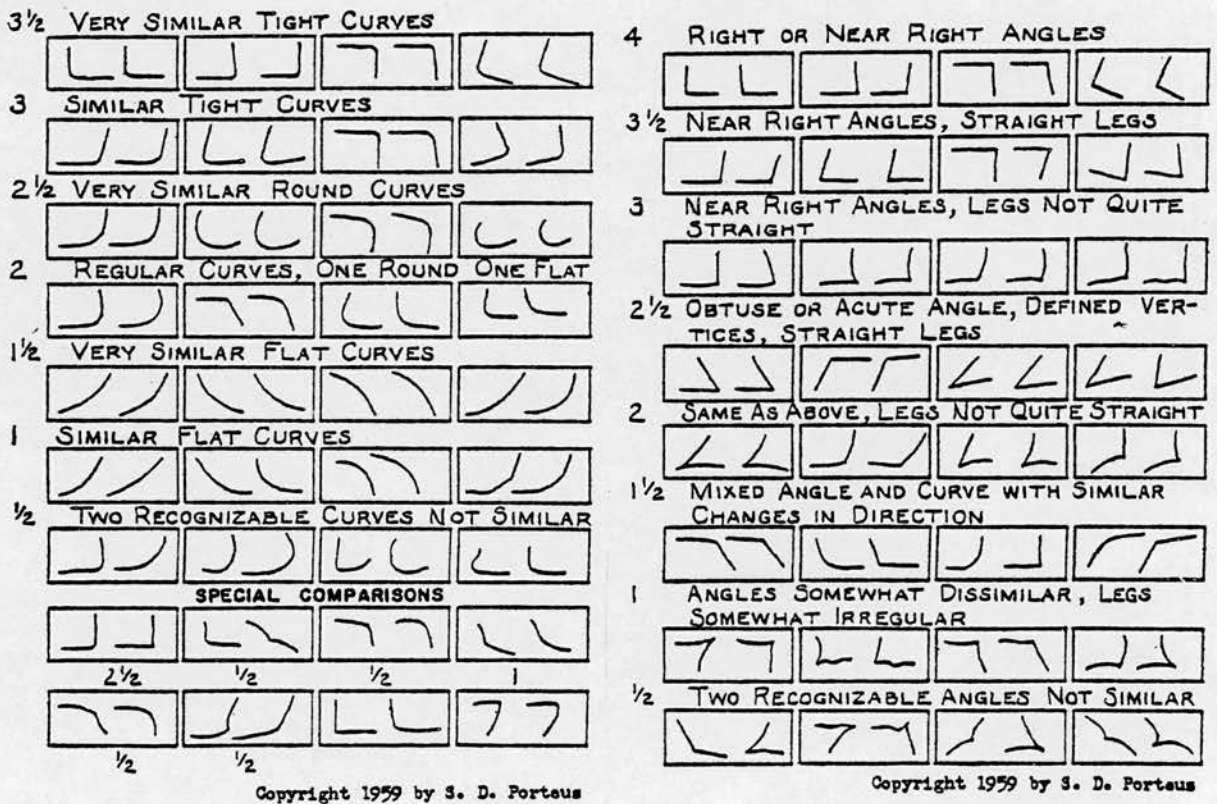
known as the Original series or Vineland Revision, the Extension and the Supplement. In this study, the so-called Vineland Revision was used since only this series was standardised from three years upwards.

The test has been used throughout half a century to study a variety of problems such as, the mental status of normal, abnormal and retarded individuals and delinquents; primitive peoples throughout the world; studies on the effects of drugs and psychosurgery. Amongst other things the test seeks to provide "a psychological measure that will give a fairer index of the social sufficiency of the mentally retarded child than can be afforded by the Binet Scale" (Porteus, 1965 p.14). Porteus developed the Maze Test to attempt to evaluate an individual's planning capacity and foresight. This ability he called "prehearsal" meaning mental trial-and-error anticipation which is to be differentiated from "rehearsal" which applies to the repetition of an activity already planned. This "prehearsal" is measured by inviting the individual to solve a series of mazes, from which the individual's ability to carry out, in proper sequence and in prescribed fashion the various steps to be taken in the achievement of the goal is assessed. It is argued that the Porteus Maze Test is an appropriate instrument to use in attempting to determine such abilities in children who present with behaviours that are inimical to successful learning.

The Porteus Maze Test yielded two scores: the usual Test Quotient and a Flexibility (or Adaptability) Score, which is described on the next page.

The Flexibility Score

Porteus, Barclay, Culver and Kleman (1960) devised a system of allotting points to paired resemblance in performance on maze drawings. They first became interested in the projective aspect of the drawings when they noticed "an adhesion to a set pattern" of performance by delinquents upon retest, Porteus (1965). A Conformity-Variability Scale was worked out, based on the matching of angles at one of the turns in the Year XI maze.



Porteus (1965) considered that the "extremes of scoring represented deviant individuals. At the low end were those who tended to be unsystematic and were minimally influenced by the structuring of the test design. At the top end of the distribution were persons of opposite temperament, those who were somewhat stimulus bound, over meticulous, too subservient to system, and inclined to be inflexible. Thus we would have at the extreme low end the disorganised and at the high end the more impulsive individuals" (Porteus, 1965 p235). The medium scores indicated moderate flexibility, that is, reasonable adherence rather than rigid devotion to a pattern of performance.

This measure was adapted for the purposes of the pilot study in the belief that it might reflect possible changes in subjects whose approaches to tasks might be influenced by exposure to the Flying Start materials.

Porteus (1965) had pointed out to the need for tests which would "go beyond the ordinary field of mental examinations", and which would assist the evaluation of such temperamental characteristics as "neatness and care in doing a job, persistence in the face of difficulties, resistance to fatigue and distraction, control of emotions, sustained attention" (Porteus, 1965 p. 14)

It was not possible to work with the same maze which Porteus had used, but since in the course of administering the series the children had attempted the Year V maze, it was decided to study the first set of right angle turns of this maze, and to take the measures in every case from the first attempt made by the child on this set of turns.

Modifications of the test's scoring procedures

An independent rater scored the turns for each of the five "at risk" children according to the guide given by Porteus above. Because of the awkwardness of using half-numbers where a difference was required, a scale of 0 to 8 was worked out, such that a score of 1 was equivalent to a Porteus half mark. A score of 0 was recorded when a child failed to draw around both corners.

Porteus made the distinction between disorganisation being demonstrated at the lower end of the scale and rigidity at the upper end. The scale of 0 to 8 was therefore divided in such a way that post-test scores were to be considered good only if they fell in the middle range, i.e., in the area of "normalcy", regardless of where the pre-test scores had occurred. Thus, changes from either "disorganisation" 0-2 or "rigidity" 7-8 to "relative flexibility" would all be considered "good". This measure will be called the Flexibility Score.

2. The Coloured Progressive Matrices Forms A and Ab is described by Raven (1965) as a "test of observation and clear thinking" each problem in the scale being the "source of a system of thought" with the order in which the matrices are presented providing a standard training in a method of working. Thus in the context of the study the Coloured Progressive Matrices offered a convenient technique for assessing the attack strategies that children might use in a problem-solving activity. The test requires subjects to complete a pattern by selecting from six figures the one "piece" that is required

to complete the design horizontally and vertically. Each problem in the series becomes progressively more difficult. The test may be administered in book form or as a form-board. The performance type form-board mode of administration was used on the basis that presenting the test in this form would be less threatening to children and would take on more of the aspect of a game.

Modifications in the test's scoring procedures

The objective in using the Ravens Coloured Progressive Matrices was to establish a measure of a child's attack strategy in problem-solving behaviour. It is argued that the Raven's Coloured Progressive Matrices might provide such an index if the instructions described by Raven (1956) were dispensed with in one important respect. In the instructions described by Raven (1956) each trial made by the subject is challenged which has the disadvantage that many children get the idea that they are wrong even when they are right. Thus it was decided that the subject be allowed to make as many choices as he likes in the process of deciding on a particular response to the test item unchallenged. This measure is called the Choice Score. It is argued that under this condition children exposed to the Flying Start programme will increase the number of choices they make before deciding upon a particular piece. The inconsequent type child who might initially be satisfied with his first selection without checking it, will demonstrate greater selectivity; whereas the unforthcoming type child who might initially "freeze" on being presented with the task, will similarly manifest attempts at the solution. In both cases, such test behaviour may be interpreted as an increase in reflectivity and hence an improvement in learning style.

3. The Animal House Subtest from the Wechsler Pre School and Primary Scale of Intelligence, Wechsler (1963) is one^{of} five performance subtests within an individual test battery for the estimation of intelligence quotients of children in the chronological age range four to six and a half years. The child is presented with a board which has rows of pictures of animals of the live-drawn type. There are four pictures repeated randomly in rows. Each one has a hole below it into which a small coloured cylinder may be placed which will indicate that the child has recognised that the animal is associated with that colour of cylinder in the code at the top of the board. The child is asked to match the cylinders to the animals in sequence - the colours of the cylinders have been chosen to avoid colour vision problems.

Such a subtest involves visual searching; attention span and concentration; sequencing and the ability to maintain a mental set for goal oriented behaviour. As such, it was selected as an appropriate test to gain some measure of problem-solving abilities of the children in the study.

Modifications in the test's scoring procedures

In the context of the full WPPSI scales, the Animal House subtest is scored on the basis of bonus points for speed of completion. It was decided to dispense with this bonus system and avoid any hint of it being a speed test on the grounds that to encourage 'speed of completion' with children who might be either of the over-reacting or under-reacting type would be counter-productive.

Children who have been exposed to the Flying Start programme will have been trained to become strategy-wise in the learning situations. Central to the behavioural approach to learning failure, Stott (1974) is the view that children's faulty learning behaviours are largely the reflection of inadequacies in their manner of coping with day-to-day learning situations. Given that improved and more efficient learning styles have been developed during the programme, these children should have made adjustments to their own classroom situations in such a way that their faulty learning behaviours will have been modified. This result should then be reflected in four ways:-

- a) a greatly improved teacher evaluation of the Child's Behaviour in the Learning Situation
- b) since children working with the Flying Start materials will receive specific training in planning and problem solving strategies, their ability to plan ahead may be demonstrated by improved scores on tasks which require this form of strategy. In particular their Porteus Maze Test quotient scores will be increased
- c) additionally, children trained in planning strategies to problems will approach a task which requires planning in a relaxed and normal manner and this should be reflected in work which is relatively free-flowing as opposed to work which is disorganised, irregular or rigidly angular and over conforming. Thus such children will show greater changes in Flexibility Scores

- d) children receiving specific training in the value of deliberating over decision making where choice is involved will show an increased score on the Choices Score of the Coloured Progressive Matrices.

C. PROCEDURES FOLLOWED IN THE PRELIMINARY STUDY

Throughout the Autumn Term 1974, the experimenter visited the class and discussed with the class teacher the completion of the Guide. During these visits the experimenter was free to observe the children, who in turn were given the opportunity of becoming familiar with him. Such a process was aimed to facilitate the adjustment which children might have to make in working with the experimenter later. (In the event, this proved to be so). The nature of the programmed learning kit to be used was not revealed to the teacher.

In January 1975, the teacher's completed Guides were examined and children selected as described above. The children's records were consulted to check on serious eye and ear conditions, but none were found and the programme was begun. The experimenter had a "teaching desk" set up in a corner of the communal area serving three teaching "bays". The pre-testing was carried out and then the group entered on the programme. The group stood close about the desk while the experimenter showed them the method of play for the game in question. This was done by involving each child in turn in a part of the game, so that all had some individual training and all had an opportunity to observe others at work. The children then separated

with parts of the particular game, and were supervised and assisted in their play. The experimenter worked with the group for half an hour twice each week for six weeks. At the end of this time, post-testing was carried out. In all, eight weeks elapsed. The teacher was allowed to use only the games which the experimenter had introduced to the group and was expressly asked not to introduce new materials to the group.

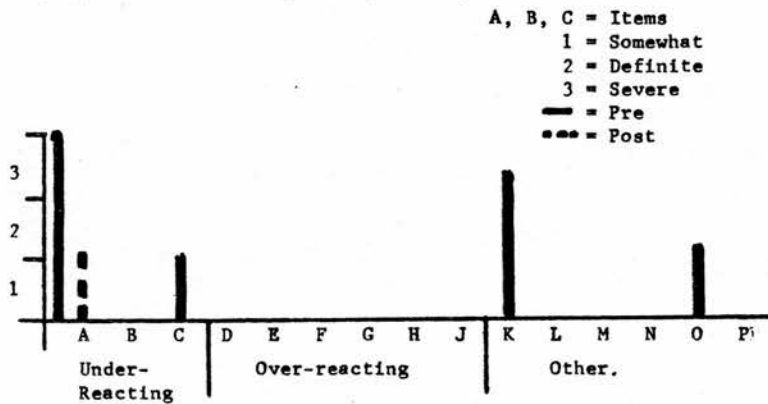
Within the limited context of working with five "at risk" children a number of lessons were learned. The most important knowledge gained at this stage is best reported in the form of case studies.

D. CASE STUDIES

Each of the five "at risk" children presented an interesting case for scrutiny. The experimenter gained most valuable practice in the method of training as well as insight into the variations of use with the materials which are possible.

CASE 1

MARY (Under-reacting) Aged 5 years 4 months.



Mary was selectively mute. At the beginning of the experimenter's visits to the class, she had never been seen to smile nor heard to talk. A minute, dainty girl, Mary was quite able to work at some tasks in the area but she seldom would. She tended to glide away from the teacher and to avoid occasions which demanded effort on her part. At free-play time, she would make for the house in the corner of the room and "house-keep", quite alone. Her profile, shown above, makes it clear that she was frozen at a level which prevented her from operating in normal situations.

At testing time, Mary was very shy, but co-operated well. She squirmed about in her seat, turned away from the work, but allowed herself to be brought back to the task. Mary was given the 2-piece cow puzzle and told she could make a cow, then left at the table with the other children. Mary remained limp and immovable. By simply not approaching the task that was presented to her, she managed to avoid performing until the experimenter returned. She was given encouragement, and completed the puzzle,

received warm praise. She showed no pleasure, however, but sat back again limply. More work was provided for her, to which she began to respond by appropriate actions, completing three 2-piece and two 4-piece puzzles. She did not speak nor did she smile, but she had shown increasing interest as the session progressed, and this was a considerable advance over her customary classroom behaviour.

Mary thereafter came along to the sessions very willingly, and began to demonstrate a fine ability to approach the learning of new tasks. After the sixth session, the teacher announced that Mary had begun to "talk like a train". She^{talked} incessantly, as if it had been her natural manner for years in this company, and was keeping the whole class entertained with news of her dog and members of her family. Mary also began to offer conversation with the experimenter, where she was coping very well with the work.

Her post-test results are interesting. She made no advance in Test Age on the Porteus Mazes, but moved up the scale of moderate flexibility on the Flexibility Scale.



On the Coloured Progressive Matrices, the change in strategy was most noticeable. Whereas her pre-test approach could only be described as "average", her post-test performance showed that she had developed a methodical approach clearly oriented towards mastery

PRE				POST							
Choices		Choices		Choices		Choices					
A	2	3	Ab	2	3	A	2	3	Ab	2	3
4	-	-	4	-	-	7	2	1	5	4	2

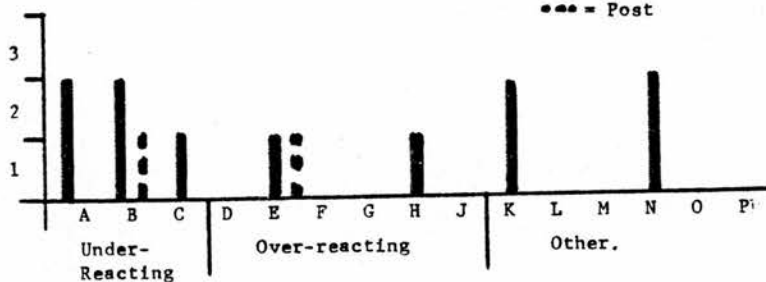
Discussion

By the end of the six week period, Mary was working in the classroom in a highly motivated manner and had become a joy to the teacher. Only occasionally did she revert to her shy manner.

CASE 2

BRIAN (Under-reacting) Aged 5 years 3 months.

A, B, C = Items
 1 = Somewhat
 2 = Definite
 3 = Severe
 — = Pre
 ... = Post



Brian was observed in the classroom to be a slow-moving, dreamy-eyed, rather handsome child. It was difficult for the teacher to elicit responses from him (Factors A and B). He seemed to prefer

his own company, or else was too shy to make friends. He had a rather rigid, solitary manner of playing (C) and was not easily drawn away from it. Brian paid scant attention to work, losing his concentration very quickly, (N), or at other times seeking to avoid set tasks (H). Brian's productive work in the class was minimal.

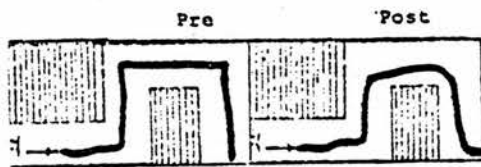
The tester had no problems with Brian. He responded surprisingly well and it became obvious from the first session that he was going to enjoy the work. He performed well, if in a robot-like manner. He would put together his puzzle, and then set as if in a dream, waiting for something new. He did not seem to be affected by the praise given for his efforts, except that he continued to work.

Brian gradually relaxed after the initial sessions and became quite effective with the materials. His work was not, however, exact. Sometimes he appeared to find it difficult to follow directions on the material, but seemed undeterred by these small failures. He accepted help but never expressed enthusiasm for the work although was always eager to attend the sessions and to work consistently during the half-hour allotted.

The teacher reported noticeable changes in the classroom. Brian was making attempts to approach other children - these were rather infantile, awkward moves such as pushing and pinching. These were interpreted as sheer naughtiness and led to some conflict for a short time. By the end of the six-week period, Brian was

still unable to respond or to concentrate his efforts in the classroom. His teacher had, however, appreciated his move towards independence in academic and social interaction.

Initially, Brian had scored a Porteus Maze Test Age of 6. On re-testing he increased this to 7. His Flexibility score, originally at the extreme end of the rigidity dimension at 8, later registered well in the range of moderate flexibility at 4. The change in styling is striking, as the diagram shows.



Scores on the Coloured Progressive Matrices were not much changed. Brian did not seem interested in this test on either occasion and did not adopt a reflective approach to it.

PRE		POST	
Choices	Choices	Choices	Choices
A 2 3	Ab 2 3	A 2 3	Ab 2 3
6 1	3	6	4

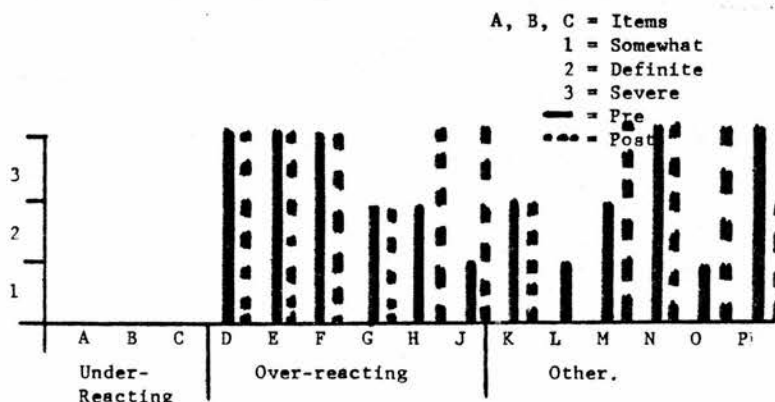
Discussion

Brian was a serious child. He did not show great pleasure at his achievements in the usual manner of children, and seemed unable to transmit his feelings in ways which would be easily recognised by his peers or teachers. Towards the end of the 6-week period he was showing an awareness of his peers. This may have been a spin-off from the small-group situation in which he found it necessary to work with others, and had found that he was able to do this successfully for the first time.

The interest, variety, and brevity of the games from the Flying Start Kit had no doubt been significant factors in first capturing Brian's attention. His success in mastering the early stages of the programme helped to release him from his "shut-in" pattern of behaviour. In Brian's case, transfer of his newly developed learning strategies to the everyday classroom environment was not complete by the end of the tester's period of study. Ideally, follow-up work in the classroom should have been prescribed, so that the teacher could be alerted to factors which would indicate ways in which she could more readily assist Brian's adaptation.

CASE 3

ROBIN (Over-reacting) Aged 5 years 4 months.



Robin was a small, wide-eyed boy. He struck the observer as a highly anxious child, nervous of strangers. His teacher described him as "a baby" who cried easily and whined a lot. She saw him as severely impulsive (D), distractible (E), and over-active (F). He also appeared to be unable to think or act independently (K), and sought to avoid any task she presented (H), seeking to get away from the activities by complaining that he did not like them. The teacher felt that Robin had ability but was not achieving because of his insistence on working his own way.

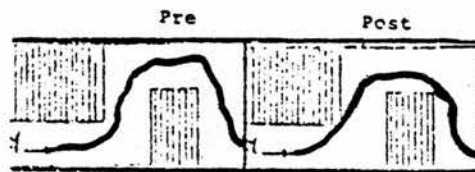
Robin's work was very swift, and between finishing his own work and receiving some more, he would move around the room a lot. As soon as it was clear that he could work independently, he was told to select a new puzzle when he had completed one and shown it. Robin found it difficult to work on the Merry-go-Round puzzles because of his tendency to be impatient. He would become absorbed in whatever materials were before him, and quickly developed signs of distress, such as flapping his hands, when he attempted to solve puzzles alone which required the collaboration of two persons. He calmed down immediately the experimenter offered help, and was able to master the problem of taking his turn.

Co-operative effort was never Robin's forte. He did not settle if any of the Merry-go-Rounds or Mail Boxes were carried on for more than a few minutes. He would carry off one of the Merry-go-Round sets and put it together himself and would leave a posting game to search for other work.

By contrast, those games at which he could work himself viz What's Happening and the 6,8 and 10-piece puzzles were interesting to Robin. He could work on his own and time did not matter, errors could be corrected, and the finished product could be perfected with a little self-discipline.

One of Robin's problems with the co-operative games was that he could always see the solution well ahead of anyone else, and since he approached all the work with such intensity, he found it difficult to wait while slower moving children took their turn. Gradually his efforts in the sessions were directed at seeking and completing work and his impatience subsided.

Robin was found to be very different in his approach to the re-testing situation. He made score change to his Flexibility Score, from disorganisation (1) to moderate flexibility (3). His Test Age was remarkably increased from 5.6 to 7.6



Robin attacked the Matrices with something of the zeal which characterised his sessions with Flying Start. He listened well to

the instructions, and scored at about group level, utilising his new found strategies of self-checking to the extent that he worked slowly and changed his selections several times. He was confident in his understanding that his patience with his own attempts would be matched by patience on the part of the tester.

PRE				POST							
Choices		Choices		Choices		Choices					
A	2	3	Ab	2	3	A	2	3	Ab	2	3
0	-	-	0	-	-	7	5	-	4	3	-

Discussion

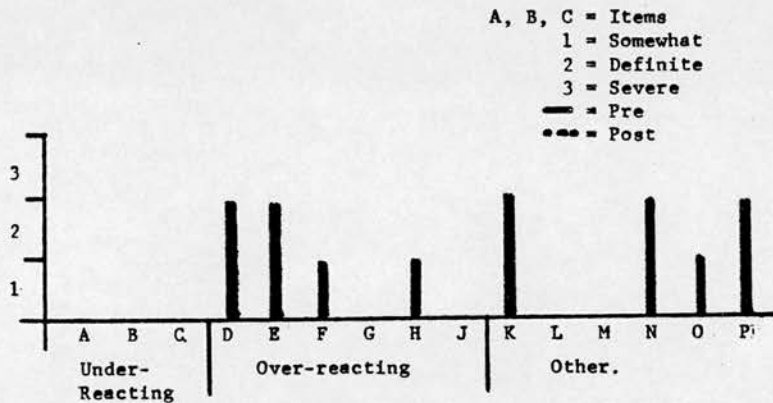
The question must now be asked. What is the meaning of Robin's post-experimental profile? His profile shows only two minor positive changes. One of these may give a clue to his new classroom image. He is no longer noted as using charm on his teacher. On the contrary, he has increased his hostility score (M). He is also seen to be rejecting learning situations by disregarding material presented to him (O), by being extremely unhelpful (J).

This child, it seems, came to reject his classroom environment. In this case, the problem cannot be presumed to be completely within the child. He is a boy capable of scoring on standardised tests well above his age level, highly developed in his competencies where the learning situation allows of his competent style. He must spend his days in an open-plan, unstructured classroom - perhaps spending his time in a meaningless way. Apparently he is unable

to use his base to further developing skills, and he cannot tolerate this frustration.

CASE 4

ANGUS (Mixed) Aged 5 years 11 months.



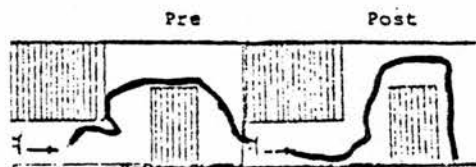
Angus was a pleasant boy who neither caused any problems of discipline in the class nor did he join in the classroom activities. He was forever wandering around the classroom, seemingly taking little notice of what was going on and rarely taking part in corporate activities.

He was reported as guessing (Category D) if he bothered to answer at all (Category K); he appeared to be out of contact with the classroom situation (Categories N and O) and would often leave work unfinished or tackle it in his own idiosyncratic way (Category P).

Angus did take notice of the investigator to the extent that whenever he arrived in the classroom he would edge towards his side, watching his every move with a half-smile on his face. The investigator found Angus very shy and difficult to communicate with during testing. He scored below his age level on both the Porteus Maze Test and the

Raven's Matrices. Initially it seemed that Angus could listen and follow instructions although he seemed a somewhat careless pupil. During one of the early sessions, he was given one of the Merry-go-rounds and shown how to play the game with another child. He followed instructions precisely and became quite accomplished at the placement of the pieces. Later, Angus was seen to be approaching his work with confidence and greater care. He was also demonstrating a capacity to select "games" for himself and show other children how to work with them. The teacher was clearly impressed by what she observed as a change in him and asked the investigator what had "been done" to him.

This improvement continued to the extent that the mask of pseudo-retardation slipped and Angus was seen to be an enthusiastic and co-operative worker who set about his work with great care. As his profile shows, the teacher reported a marked improvement by the end of the 6-week period. The improvement in his learning style was reflected in his post-test results. The Flexibility score moved from 3 to 5, and his Test Age rose from 5.6 to 7.6.



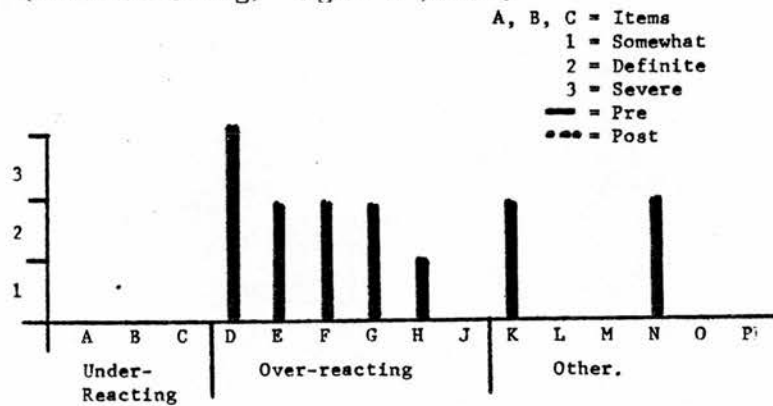
On retesting Angus on the Raven's Matrices, he took his time. It seemed that his "decision-making" was done at a mental level so that his choices were not made obvious and therefore could not be recorded.

Discussion

It is apparent that Angus benefitted from the programme. The materials generated an intense interest in him and he seemed to spend much more time with them than did the other four pupils. This no doubt had an influence on the total effect. Perhaps it is this intensity of response that is required for such a dramatic improvement. Furthermore the success story is partly due to Angus having a teacher who observed the changes in his learning strategies and went out of her way to encourage him.

CASE 5

CHARLIE (Over-reacting) Aged 6 years.

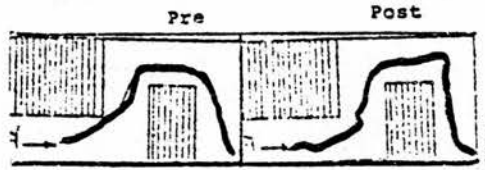


Charlie could not adapt to the situation which existed in his open-plan classroom. The teacher saw him as over-active (D), impulsive (E), fidgety (F), and somewhat unpredictable (G). He also lost interest in the work set (N) and appeared disinterested (K). He was not shy but equally not interested in visitors.

Charlie took to Flying Start surprisingly well. He approached each stage with zeal. He began to demonstrate care and patience, and was able to co-operate well with others in the group. There was no dramatic point for Charlie. It was noticed however in the second week i.e. after 3 sessions that his teacher began to refer to him favourably. Apparently he had begun to settle down to the conditions of the classroom and was using his new-found skills to make work for himself which the teacher saw to be productive.

On retest his Porteus Test Age rose 18 months without any

change in his Flexibility Score.



Charlie's first scores on the Matrices had been almost maximal, so that little change in a positive direction would have been possible.

Discussion

It became clear during the experimental sessions that Charlie was capable of performing in a highly effective manner, although he had appeared to the teacher as quite disorganised. It is likely that he had been reacting against the open setting of his classroom in which he had, initially, been unable to function to his own satisfaction. His adaptation would no doubt stand him in good stead.

E. CONCLUSIONS

Arising from the pilot study a number of important lessons were learned. In particular, valuable experience was gained in working with children, individually and in groups, using the Flying Start materials. In addition, difficulties resulting from the format of the materials came to light and thus began at this early stage the process of formative evaluation of the programme which is reported in Chapter 3. These factors played an important part in determining how the experimenter set about working with the experimental group in the main study. One important outcome from the preliminary study was the need to reappraise the assessment techniques used in the light of problems and comment that were raised.

In the case of the Porteus Maze Test, both the experimenter and the independent rater raised serious doubts as to the appropriateness of the modified Flexibility Score. It was felt that the method of scoring was too subjective and that the principle of grading only the first set of right angle turns on the Year V maze discarded data that might otherwise be used in interpreting the child's overall performance.

Turning to the Animal House sub-test, in the case of the five children in the preliminary study all successfully completed the item and within the time-limit set by Wechsler (1963). Thus, this item

was found not to be discriminating enough and as an index of attack behaviour in problem-solving situations it was felt that it had little to offer and should be discarded from the main study.

Lastly, the assumptions that an increased Choice Score on the Ravens Coloured Progressive Matrices would indicate an increase in reflectivity consequent upon exposure to the Flying Start programme might be interpreted as naive optimism. Correspondence and personal discussion with O'Neill then at the University of Guelph, Canada and embarked on a related project subsequently reported in O'Neill (1978), suggested that it was doubtful if an increase in the number of trials could be interpreted as an improvement in learning style. It was possible that such an increase could represent increased reflectivity; but equally so it could represent, hesitancy. By the same argument, it could not be assumed that a single initial trial - correct or otherwise - indicated impulsivity, a child might well have successfully conducted his/her rehearsal strategies at an internal level. Donaldson (1978) in her account of the present state of thinking about children's thinking indicates that this ability to carry out complex thought process is possible in quite young children. In the face of these serious doubts about the underlying assumptions surrounding the Choice Score of the Raven's Coloured Progressive Matrices, it was decided to discard it from the battery of tests used by the experimenter.

F. REVISION OF MEASURES

Following upon the experiences gained on the preliminary study careful consideration was given to -

- deciding upon a test to replace the Raven's Coloured Progressive Matrices
- developing a more reliable method of scoring the Porteus Maze Test such that the whole track traced by a child would be used

In deciding upon a test to replace the Raven's Coloured Progressive Matrices four criteria had to be met -

1. the test would require to be one whose format and required response mode called for simple responses from the children e.g. a crude pointing capacity being sufficient
2. the test would require to be as free of cultural influences as is possible given that there can be no such thing as a truly culture-free test. In effect the test should be independent of reading and other language skills
3. the test would require to be one that attempted to sample reasoning ability and where the testee was required to scan a number of possibilities before making a choice
4. the test would require to be one that was appropriate for use with 5/6 year old children and one for which sufficient normative data were available

In consulting Buros (1972) it was felt that the Columbia Mental Maturity Scale (CMMS) developed by Burgemeister, Blum and Lorge (1972) met all four criteria -

1. the test is an easily administered individual test comprising 92 pictorial and figural classification items. Each item

comprises from three to five drawings. For each item, the child is asked to look at the card, select the one which is different or unrelated to the others and indicate his choice by pointing.

2. the test is a non-verbal test and the objects depicted are claimed by Burgemeister et al (1972) "to be within the range of experience of most children even those whose environmental backgrounds have been limited". (CMMS manual p.7)
3. Burgemeister et al (1972) claim that the behaviours measured by the CMMS include both "simple perceptual classification tasks and higher-level abstract manipulation of symbolic concepts" (CMMS manual p.7)
4. the CMMS was developed for use with children in the age range 3 years 6 months to 9 years 11 months. The scores that are yielded by the test include an Age Deviation Score (ADS) and a Percentile Rank (%tile). The ADS's are numerical comparisons of the effectiveness of a child's performance on this test with a carefully selected sample of children who were of the testee's age. The normative data provided in the test manual indicate that the standardisation sample yielded a mean score of 100 with a standard deviation of 16. The Percentile Ranks indicate the rank of a given child when his score is compared with those obtained by a specified norm group. In this way test scores can be meaningfully expressed in terms of how that score ranks alongside those obtained by the norm group.

Thus a five-year old child with an ADS of 102 on the CMMS has a percentile rank of 55 which is interpreted as meaning that 55% of five-year old children in the CMMS norm group obtained a score equal to or below 102.

Random trials using the CMMS in various schools proved to be encouraging. Children found the task non-threatening and with even the most shy child the experimenter found that responses were forthcoming. Moreover, the manual is specific in its instructions that testers sit opposite their testees - in this way it is possible to observe and comment upon those aspects of the testee's behaviour that are not scored but are qualitatively important e.g. eye movements as the child checks and rechecks. The Columbia Mental Maturity Scale met all criteria adequately and was included in the battery of tests used in the main study.

The experimenter was impressed by the arguments for retaining the Porteus Maze Test in the battery but was doubtful that the Flexibility Scale described by Porteus, Barclay, Culver and Kleman (1960) was appropriate. The basic misgiving was over the amount of judgement needed in obtaining the Flexibility score as developed by Porteus et al (1960). The decision was taken to retain the Porteus Maze Test and to apply the Porteus et al scoring technique in the event that no refinement to the procedure was forthcoming.

The experimenter developed a grid to be placed over the child's track on the Year V Maze on which was superimposed an "ideal track". Deviations by the child from that "ideal track" over the whole maze tracing would be counted thereby yielding a score which would be

arrived at more objectively. After trying this method out on the five maze tracks produced by the children in the preliminary study it was decided to abandon this method on the grounds that what is technically an ideal track is not necessarily ideal psychologically. A slight but consistent shift to the right or to the left could create quite a divergence. Furthermore, many children in attempting the Year V Maze cut the corners to their finest - and there is some sense in doing this - but an "ideal track" method of scoring would not allow for individual variations to this extent. Thus some method of quickly measuring the overall length of the track would appear to be the best way of overcoming the problem.

Stott (1977) suggests that the best way of scoring children's tracks is to overlay the maze with the grid and simply count the number of squares that the child's line cuts. The rationale of this is that a good solution is also an economical one. Thus the smaller the number of squares cut, the better the solution. In the event of a child failing to complete the task, say out of nervousness, he can be immediately classified clinically and for statistical purposes could either be left out or given an agreed maximum score.

Trials on the five tracks produced by children in the preliminary study indicated that this method of scoring met the criticisms of the Porteus et al (1960) method indicated above. In this report, the method of superimposing a grid over the whole maze and counting the number of squares cut by the track, is used as the basis of calculating a Maze Tracking Score. A sample of the grid is attached on the following page.

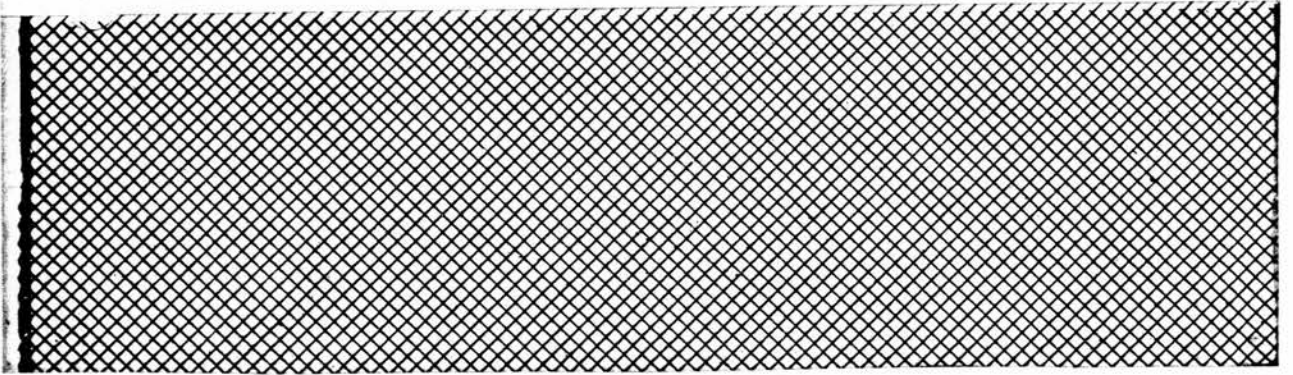


FIGURE 17 Sample of grid "overlay" for Scoring Maze V Tracks

The preliminary study therefore provided a valuable basis for refining procedures and techniques which were to prove beneficial in the conduct and subsequent analysis of the Main Study. It is to consideration of this that we now turn.

CHAPTER 6

THE MAIN STUDY

A. THE DESIGN OF THE EXPERIMENT

Stott (1975) suggests that in drawing up samples for study, an appropriate procedure is to take all schools in a defined geographical area. The rationale of such an approach is to ensure that schools are selected to represent the proportion of types of neighbourhood served by the school system as a whole. Such an approach to sampling is consistent with the general principles of sampling as described by such commentators as Butcher (1966) and Moser and Kalton (1971). The target population for this study was the Primary 1 age group, thus the investigator took as the sample, all the Primary 1 classes in all Primary Schools other than two-teacher schools in the Tweeddale Division of the Borders Regional Authority, Scotland. The decision to discard the two-teacher schools from the study was taken on the grounds that the overall numbers of pupils in each of those schools were less than ten and that within such schools there were never more than two pupils at the Primary 1 stage and in three of the schools, there were no pupils at this level.

The Tweeddale division is a geographically self-contained area comprising the former Scottish county of Peeblesshire. It is largely an agricultural area although the two main population centres, Peebles (6,000 population) and Innerleithen (3,500 population) are the main loci of industrial activity - predominantly tweed manufacturing and

related activities. By the criteria of omission referred to above, six primary schools remained, yielding a total population of 165 children enrolled in the Primary 1 classes as at enrolment date August, 1975.

The timetable operated by the investigator was determined by such factors as: allowing the pupils and teachers to become familiar with each other; enabling the experimenter to brief the teachers on the nature of study; familiarising the teachers in the use of the Guide to the Child's Learning Behaviour; and allowing the children to become accustomed to the regular presence in their classrooms of the investigator. Thus it was towards the end of November, 1975 that teachers completed the Guides for each of the 165 children in the sample.

Table 2 records the distribution of faulty learning styles as expressed as a mean value for the total population (n=165) on each of the sub categories of the Guide to the Child's Learning Behaviour

Category	Total Score	Mean
A	43	0.26
B	30	0.18
C	30	0.18
D	60	0.36
E	69	0.42
F	26	0.16
G	0	0.00
H	37	0.22
J	7	0.04
K	13	0.08
L	5	0.03
M	9	0.05
N	42	0.25
O	16	0.09
P	23	0.14

TABLE 2 Distribution of faulty learning styles within total population (n=165)

Figure 18 shows in the form of an histogram the distribution of mean scores on the fifteen behaviours described in the Guide to the Child's Learning Behaviour. By the criteria described earlier

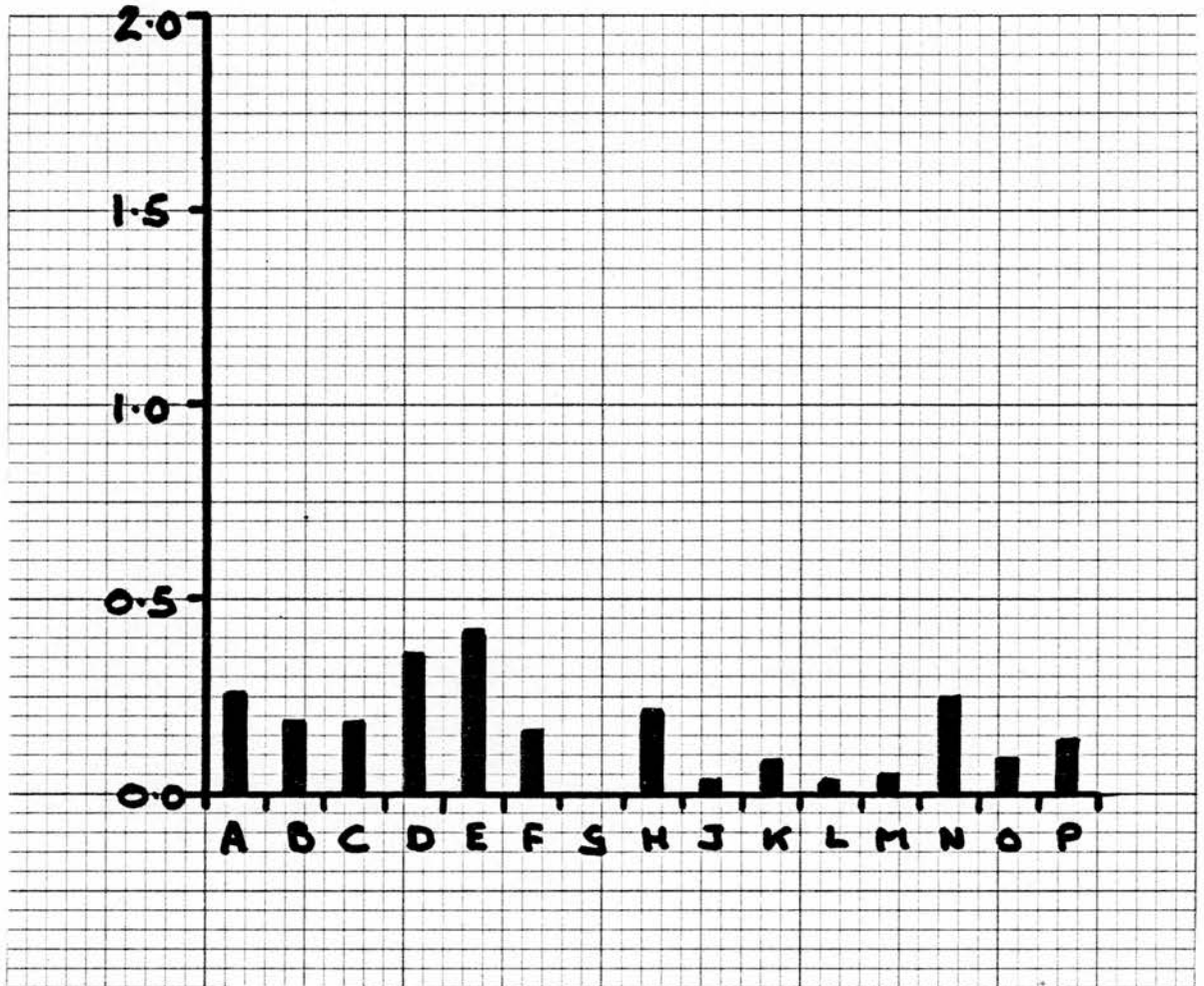


FIGURE 18 Distribution of Means for GCLB for total population
(n=165)

in the preliminary study for identifying the children potentially "at risk" for learning failure (viz. the presence of one or more "Severe" signs, or two or more "Definite" signs), 34 children in the sample were so identified as being "at risk". This figure represents 20.61% of the population which compares with Stott's

(1971) estimate of between 19% and 22%. These 34 children were distributed amongst four of the six schools as shown in Table 3.

School 1	(Code R)	8 pupils from 36	(small industrial town - sole Primary school)
School 2	(Code B)	8 pupils from 36	(small town - school serving rural area)
School 3	(Code P)	8 pupils from 43	(moderate sized town - one of three Primary schools)
School 4	(Code K)	10 pupils from 30	(moderate sized town - one of three Primary schools)
School 5	(Code WL)	0 pupils from 12	(small town - school serving rural area)
School 6	(Code W)	0 pupils from 8	(village - school serving rural area)
		<u>34</u>	<u>165</u>

TABLE 3. Distribution by school of "at risk" children.

Schools 5 and 6 - coded WL and W respectively were discarded from the study. The four schools remaining were all designed on "open-plan" principles.

Table 4 represents the pre-test distribution of faulty learning styles within the "at risk" population (n=34) compared with the remainder of the population (n=131).

Category	"At Risk" Group n=34		Remainder of Population n=131	
	Total Score	Mean	Total Score	Mean
A	29	0.85	14	0.11
B	27	0.79	3	0.02
C	23	0.68	7	0.05
D	42	1.24	18	0.14
E	60	1.76	9	0.07
F	23	0.68	3	0.02
G	0	0.00	0	0.00
H	24	0.71	13	0.10
J	7	0.21	0	0.00
K	13	0.38	0	0.00
L	5	0.15	0	0.00
M	9	0.26	0	0.00
N	37	1.09	5	0.04
O	14	0.41	2	0.02
P	19	0.56	4	0.03

TABLE 4 Pre-Test Distribution of faulty learning strategies -
"at risk" group (n=34) compared with remainder of
population (n=131).

Figures 19 and 20 represent by histograms the distribution of mean scores on the Guide to the Child's Learning Behaviour for the "at risk" group and the remainder of the population respectively. The method of selection makes statistical analysis inappropriate. The marked differences observed are such that one is able to presume that the "at risk" population is dramatically different from the population from which it is drawn. Furthermore, the rationale of the Guide (as described earlier) is such that the technique is used to screen children for behaviours that might be considered inimical to successful learning thus it follows that any group of pupils so identified would present markedly different profiles from the rest

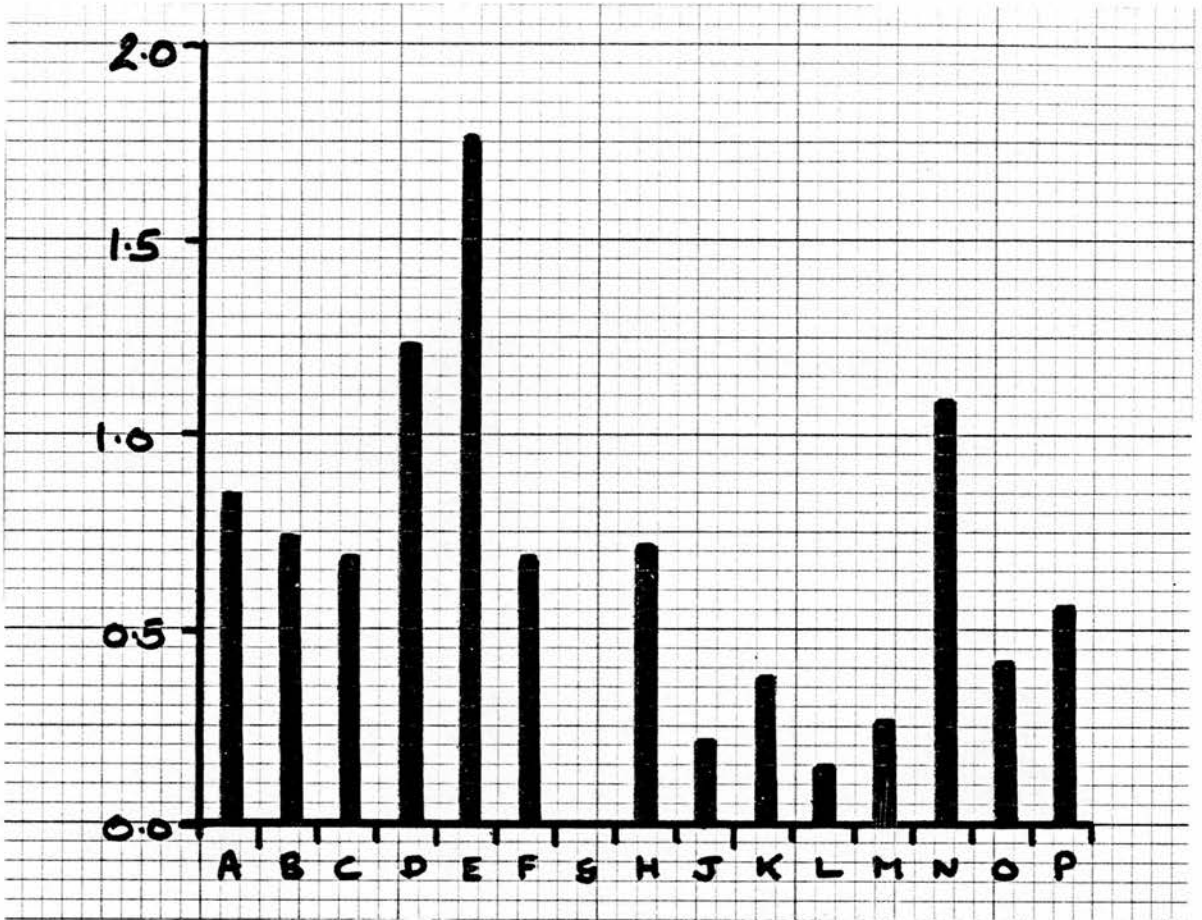


FIGURE 19 Distribution of Mean Scores for GCLB for "at risk" group
(n=34)

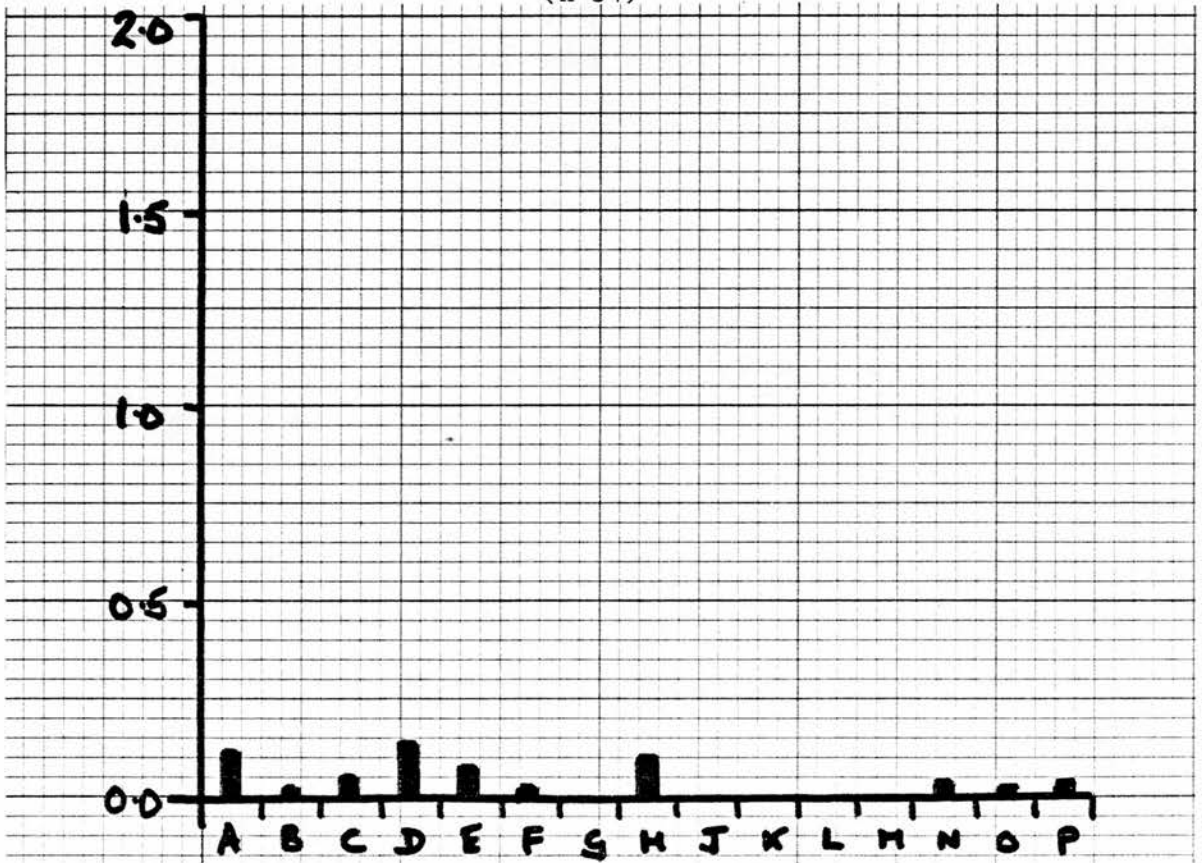


FIGURE 20 Distribution of Mean Scores for GCLB for remainder of
population (n=131)

of the population. Also, within the "at risk" group there was no marked variation in the teachers' individual preference for one category or another. However, collectively, they identified a greater amount of over-reacting than under-reacting behaviours. Beilin (1959) reported that teachers were less concerned with withdrawing behaviours and more concerned with over-reacting behaviours - this phenomenon is observed in this study.

The 34 "at risk" children were divided into an Experimental (E) and a Control (C) group. This randomising was done in such a way that each of the four schools, wherein "at risk" children were identified, was used. Thus in Schools coded R, B, P and K respectively the children identified as "at risk" were randomly assigned to either the Experimental group or the Control group using the simple random sample method described by Moser and Kalton (1971). Given that the sample was already an age cohort from a reasonably homogeneous socio-economic population no further matching was attempted. Furthermore, no matching on the basis of scores on intelligence tests was made since it is argued by this writer that in considering inappropriate behavioural styles as causes of learning failure such inappropriate behaviours are as likely to affect overall test performance of such children as not.*

Table 5 reports the distributions of scores on the Guide for both E and C. Inspection would seem to indicate that the pattern of both groups is broadly similar. By subjecting these data to a

* As will be reported later in this Chapter, the fact that the experimental group significantly improved their performance on a standardised intelligence test, offers some support for this point of view.

Category	Experimental Group (n=17)			Control Group (n=17)			t	df
	Total Score	Mean	S.D.	Total Score	Mean	S.D.		
A	17	1.00	1.27	12	0.71	0.86	0.79	32
B	13	0.76	1.10	14	0.82	0.88	0.34	32
C	10	0.59	1.06	13	0.76	1.03	0.49	32
D	22	1.29	1.10	20	1.18	1.33	0.28	32
E	31	1.82	1.24	29	1.71	1.05	0.30	32
F	15	0.88	1.09	8	0.47	0.80	1.44	32
G	0	0.00	-	0	0.00	-	-	-
H	13	0.76	0.92	11	0.65	0.79	0.20	32
J	4	0.24	0.44	3	0.18	0.39	0.41	32
K	6	0.35	0.70	7	0.41	0.80	0.23	32
L	2	0.12	0.33	3	0.18	0.39	0.47	32
M	4	0.24	0.75	5	0.29	0.69	0.24	32
N	18	1.06	1.20	19	1.12	1.22	0.14	32
O	8	0.47	0.62	6	0.35	0.70	0.26	32
P	10	0.59	1.06	9	0.53	0.80	0.37	32

TABLE 5 Pre-Test Distribution of faulty learning styles E and C groups

t-test no significant differences were reported thus it may be assumed that both Experimental and Control groups are comparable.

All 34 children were pre-tested by the experimenter using the tests described earlier. These were administered in the sequence : Porteus Maze Test and Columbia Mental Maturity Scale. The sessions with each child lasted about fifteen minutes. Instructions for the Porteus Maze Test and the Columbia Mental Maturity Scale were taken verbatim from the relevant Manuals (Porteus, 1965 and Burgemeister et al, 1972).

The experimenter worked with these children in eight groups (four E and four C) in their schools for two half-hour sessions over eight weeks, making sixteen sessions in all. With the "E" groups the Flying Start materials were used as recommended by the Manual with the changes, additions etc. found to be necessary as a result of the pilot study conducted by the experimenter and reported earlier. The experimenter supervised the children's "play", in pairs mainly, and allowed materials introduced at each successive session to be available to the children to work with until the next session but not to the control group or the rest of the class. With the control group, "play" materials, not to be made available to the experimental group or to the rest of the class, were collected together by the experimenter. These comprised jigsaw puzzles, letter bingo, concept cards etc. Superficially many of these games were similar to elements of the Flying Start material but were neither graded systematically nor put in any sequence nor structured in any way that could be described as a "programme". Thus, both groups received individual

attention but were exposed to quite different experiences in the sessions. Care was taken to alternate the sessions on successive visits to schools so that if "E" group was seen first on one session then "C" group would be seen first on the next session and so on. The experimenter was satisfied by the teachers' reports that the rule regarding the availability of materials between sessions was not substantially violated. Illustrations 1 to 4 depict the "play corners" set up in each of the four classroom areas. Since each school was designed on "open-plan" principles, there was sufficient space and privacy for these areas to be maintained although in the course of the sessions rudimentary screens were set up to attempt to reduce the amount of distraction on the groups. This was not wholly effective, but in general practice was found to provide that degree of separation which enabled the groups to work with the investigator without too much "interference" from passing pupils.

At the end of the eight week period, the Guide was completed by the teachers for each of the 34 children and the investigator re-administered the Porteus Maze Test and the Columbia Mental Maturity Scale. Table 6 represents the post-test distributions of both "E" and "C" groups on the Guide to the Child's Learning Behaviour. The design of the study was therefore in the classical Pre/Post Test format.



ILLUSTRATION 1

"Play Corner" in School coded R

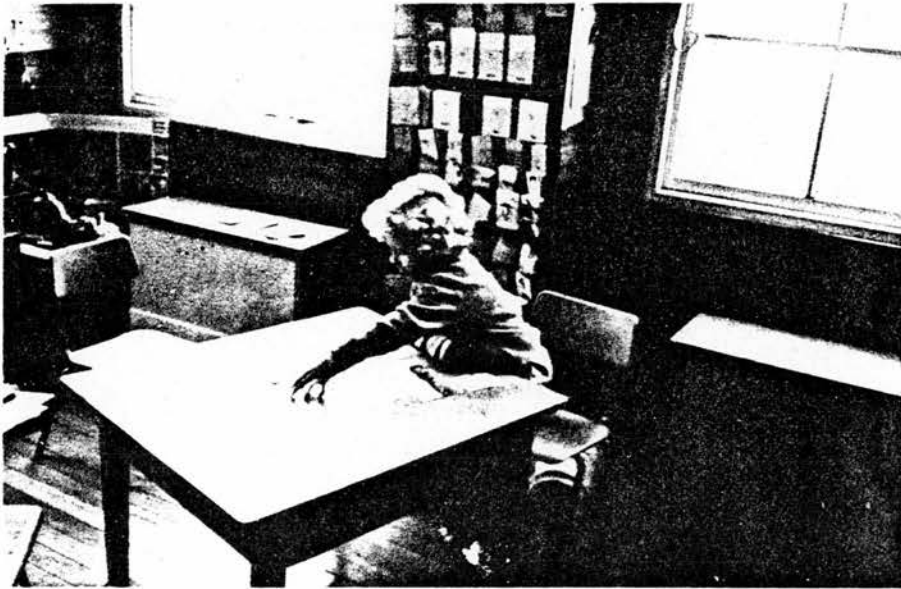


ILLUSTRATION 2

"Play Corner" in School coded B



ILLUSTRATION 3 "Play Corner" in School coded P



ILLUSTRATION 4 "Play Corner" in School coded K

Category	Experimental Group (n=17)			Control Group (n=17)		
	Total Score	Mean	S.D.	Total Score	Mean	S.D.
A	6	0.35	0.47	10	0.59	0.62
B	2	0.12	0.33	14	0.82	0.73
C	3	0.18	0.53	11	0.65	0.99
D	8	0.47	0.62	18	1.06	1.25
E	12	0.71	0.47	23	1.35	0.70
F	3	0.18	0.39	7	0.41	0.71
G	0	0.00	-	1	0.06	-
H	3	0.18	0.53	8	0.47	0.72
J	1	0.06	0.24	2	0.12	0.33
K	2	0.12	0.49	8	0.47	0.80
L	1	0.06	0.24	1	0.06	-
M	2	0.12	0.49	3	0.18	0.39
N	5	0.29	0.53	16	0.94	0.61
O	1	0.06	0.24	4	0.24	0.56
P	0	0.00	-	8	0.47	0.87

TABLE 6 Post Test Distribution of faulty learning styles - "E" Group and "C" Group

Visual inspection reveals a difference between the distributions; or whether/not this difference is statistically significant is reported in a later section of this Chapter.

During the course of the experiment, meticulous notes were taken of the progress of the children. With the permission of the Headteachers, an attempt was made to tape record each session so that responses of the children would not be lost. This proved to be unsuccessful both technically and in the difficulties created by children asking "What's that for?" etc. In practice it was found that notes were sufficient and it was found possible to make observations during the sessions with ease.

After the sixteen sessions (eight weeks) the groups were disbanded. The average attendance for all subjects was 15.3 sessions. No

subjects were lost. It is perhaps relevant to point out at this stage that the investigator had previously had broad experience in teaching and had become involved in small group and individual situations with young children in his clinical work in a unit for exceptional children within a paediatric hospital setting.

B. HYPOTHESES

It is part of the rationale of the Flying Start material that children who have been exposed to the programme will have been trained to become strategy-wise in learning situations. It has been assumed that their faulty learning behaviours are largely the reflection of inadequacies in their manner of coping with day-to-day learning situations. Given that improved and more efficient learning styles have been developed during the programme, these children should have made adjustments to their own classroom situations in such a way that their faulty learning behaviours will have become modified. This result should then be reflected in a greatly improved teacher evaluation of the Child's Behaviour in the Learning Situation. Thus:-

Hypothesis 1: Teacher evaluation of children exposed to the Flying Start programme will show significant improvements in their ratings on the Guide to the Child's Learning Behaviour as compared with teacher evaluations of children in a control group.

The Flying Start group will receive specific training in planning and problem-solving strategies. Therefore their ability to plan ahead may be demonstrated by improved scores on tasks which require the use of this form of strategy. Thus:-

Hypothesis 2: The Flying Start group will significantly increase their Columbia Mental Maturity Scale scores whereas the Control group will not do so.

The Flying Start subjects who have had training in planning strategies to problems will approach a task which requires such planning in a controlled, organised manner. Thus:-

Hypothesis 3: The Flying Start group will show a significantly improved score on the Maze V Tracking Test as compared with the Control group.

C. TEST RESULTS

In this section are presented the statistical results related to the tests used in the study. The order of presentation of the results and the statistical procedures applied are indicated as follows.

To test for the significance of differences between means on each of the fifteen categories of the Guide to the Child's Learning Behaviour a z test was applied. Subsequent to this the data were pooled and a Mann-Whitney U was used to test the differences on mean gains on two pooled categories. The reasons for these procedures being applied are considered below. t-tests were used to test for significance on the mean gains on the Columbia Mental Maturity Scale Age Deviation scores and the Porteus Maze V tracking test scores.

The Guide to the Child's Learning Behaviour

Table 7 shows the Pre/Post test distribution of faulty learning styles for both "E" and "C" groups with the obtained z scores.

Categories	Experimental Group - "E" (n=17)				Control Group - "C" (n=17)				z
	Pre Test	Mean	Post Test	Mean	Pre Test	Mean	Post Test	Mean	
A	17	1.00	6	0.35	12	0.71	10	0.59	-0.99 NS
B	13	0.76	2	0.12	14	0.82	14	0.82	-1.87 NS
C	10	0.59	3	0.18	13	0.76	11	0.65	-0.59 NS
D	22	1.29	8	0.47	20	1.18	18	1.06	-1.25 NS
E	31	1.82	12	0.71	29	1.71	23	1.35	-0.31 NS
F	15	0.88	3	0.18	8	0.47	7	0.41	-1.35 NS
G	0	0.00	0	0.00	0	0.00	1	0.06	Not applied
H	13	0.76	3	0.18	11	0.65	8	0.47	-0.80 NS
J	4	0.24	1	0.06	3	0.18	2	0.12	-0.70 NS
K	6	0.35	2	0.12	7	0.41	8	0.47	-0.88 NS
L	2	0.12	1	0.06	3	0.18	1	0.06	-0.40 NS
M	4	0.24	2	0.12	5	0.29	3	0.18	-0.36 NS
N	18	1.06	5	0.29	19	1.12	16	0.94	-1.55 NS
O	8	0.47	1	0.06	6	0.35	4	0.24	-1.54 NS
P	10	0.59	0	0.00	9	0.53	8	0.47	-1.21 NS

TABLE 7 Pre/Post Distribution of scores on Guide to Child's Learning Behaviour

The statistical analysis of the data as they are presented on previous page poses something of a problem. Each of the fifteen categories in the Guide is rated only on a four-point scale, 0-3. The effect of this is that the data regarding the rating of children's behaviour is spread very thinly indeed thereby exerting an enormous constraint on the statistical analysis. The appropriate statistical procedure to apply would be one dealing with proportions such as the z test. The z test is however a large sample statistic and in the present study the respective cells number 17 in each case thus calling for a small sample procedure. Given the data as they are presented, Guilford (1965) offers no appropriate procedure. Had the sample been large, then the z-test would have been the instrument to use; in the absence of an appropriate small-sample statistic the decision was taken to apply the z-test with more stringent limits i.e. the 0.01 level (for large samples to reach the 0.05 level of significance z would require to be 1.96)* Inspection of Table 7 shows that none of the categories even approaches the 0.05 level (Category B approximates with $z = -1.87$) therefore by applying more stringent limits of probability the null hypothesis is supported and no significance may be attached to the observed differences between means.

* The formula used to calculate z was

$$z = \frac{(A-B) - (C-D)}{\sqrt{\frac{A(17-A)+B(17-B)+C(17-C)+D(17-D)}{17}}}$$

where change in the proportion of the Control group pre minus the Control group post are subtracted from the corresponding change in the Experimental group pre minus the Experimental group post - this, all being divided by the square root of the sum of the standard errors of the four proportions.

The fundamental problem posed by the data is that there may well be some difference but the thinness of these data across the categories obscures any significant differences that might be there. In the same way that a weak radio signal requires powerful amplification before it may be intelligible so there is a need to consider an analogous "amplification" of these data. There is too much variation in these data and by looking at each individual category any effects that might be there are insufficient to allow them to be distinguished from error variation. To continue this line of argument, if there were to be an effect and if it were possible to "pool" the categories in some meaningful way then, if there are effects these should be cumulative when the data are "pooled" whereas, error variation is not cumulative. The question is - can the fifteen categories be "pooled" in a way that makes psychological sense?

Inspection of the Guide and the relevant literature e.g. Stott (1971, 1972, 1975) indicates that the fifteen categories can be clustered into an "Under-reacting" cluster, an "Over-reacting" cluster and a cluster of six "Other" categories. In the present study, the investigator is interested in the distinction that is made between the category of poor learner who might be described as "Unforthcoming" (described in the Guide by Categories A, B and C) and the category of poor learner described as "Inconsequent" (described in the Guide by Categories D, E, F, G, H and J). Moreover, there is an extensive literature of which Kagan (1965a, and 1965b) and Kagan, Pearson and Welch (1966) are representative, that distinguishes between the "reflective" and "impulsive" child. A detailed reading of this and

relevant literature leads the writer to suggest that Kagan et al are describing in broadly similar terms but with different labels the "unforthcoming" and "inconsequent" children described by Stott. There is a prima facie case for "pooling" the present data then into two categories viz an "Under-reacting" cluster (comprising the 3 categories A, B and C) and an "Over-reacting" cluster (comprising the 6 categories D, E, F, G, H and J) - for present purposes the remaining six categories are discarded from the analysis.

In handling these "pooled" data the Mann-Whitney U-test as described by Guilford (1965) is the appropriate technique to apply since it can be used with small samples and the data being pooled are more manageable. Table 8 shows the results of a Mann-Whitney U test on the differences on mean gains on the two "pooled" clusters.

Here the "over-reacting" cluster of six scales change scores (i.e. pre test - minus - post-test) of the experimental group are significantly lower than those for the control group. Similarly with the "under-reacting" cluster of 3 scales, the change scores of the experimental group are significantly lower than those for the control group. Thus, Hypothesis 1 is supported, namely that teachers' evaluation of children exposed to the Flying Start programme will show significant improvements in their ratings on the Guide to the Child's Learning Behaviour as compared with teacher evaluations of children in a control group.

The Columbia Mental Maturity Scale

The Columbia Mental Maturity Scale Age Deviation score for each subject in the experimental and control groups are tabulated in Appendix C. In order to demonstrate that "E" and "C" groups

	Experimental group (n=7) mean scores			Control group (n=17) mean scores			U	z	P
	Pre test	Post test	Change	Pre test	Post test	Change			
Under-reacting cluster	2.35	0.65	1.70	2.29	2.06	0.23	46.5	3.38	0.001
Over-reacting cluster	5.00	1.59	3.41	4.18	3.47	0.71	69.0	2.60	0.01

TABLE 8 Mann-Whitney U Tests on "pooled" clusters.

are derived from the same population a t-test was applied to test for any significance in the difference between the pre-test mean scores of the experimental group ($m=81.65$) and the control group ($m=81.53$). The obtained t of 0.05 with 32 degrees of freedom is non significant and therefore it may be assumed that these two groups are from the same population.

Subsequently a t-test was applied to test for any significance in the differences between the means of the change scores for each group, with the following result:

<u>Experimental group (n=17) means</u>			t	df	p
pre-test	post-test	mean diffs			
87.0	100.8	13.65			
<u>Control group (n=17) means</u>			7.68	32	< 0.01
pre-test	post-test	mean diffs			
87.76	90.35	2.59			

Thus Hypothesis 2 is strongly supported - viz that the Flying Start Group will significantly increase their scores on the Columbia Mental Maturity Scale whereas the Control group will not do so. We may conclude that the intervening programme did have an effect on the Flying Start subjects in respect of their training in planning and problem-solving strategies. Given the rationale of the Columbia Mental Maturity Scale as described by Burgemeister et al (1972) then this finding is consistent with the functions of the particular test. A detailed description of these functions was given in Chapter 5

The Porteus Maze V Tracking Test

The selection and administration procedures of this test have been described in an earlier Chapter. Prior to analysis of the data an independent rater was asked to calculate the number of squares cut

on the grid for each of the 34 subjects on the Year V Maze. The measure of correspondence between the independent rater's and investigator's calculations was within $\pm 5\%$ and considered therefore to be in general agreement. For the purposes of statistical analysis, the independent rater's calculations were taken. These data are tabulated in Appendix. D.

Additional preparation of the data was required in the case of 3 subjects within the Flying Start pre-test group coded R3, R4 and K14 respectively. R3 and K14 "short-circuited" the maze by cutting directly through the "walls" in the last third of the track. R4 did not begin the track. There were no irregular attempts in the Control group pre-test and both groups posed no problems in respect of their post-test performances. Porteus (1965) describes a qualitative scoring method for the Maze test which is based on penalty points being added according to which third of the Maze the errors occur. It was decided to adopt this principle to the present scoring technique - thus a penalty score of 37 was applied for any short-circuiting of the Maze depending upon whether it occurred in the first, second or last third. The score of 37 was arrived at by dividing the mean score for the experimental group by 3 and rounding up to a whole number. In the case of R3 and K14 the short-circuiting occurred in the last third of the Maze therefore a penalty score of 37 was applied. With R4 who did not start the Maze it was decided to award him a notional score, namely the mean score for the experimental group i.e. 110.

A t-test was applied to test for any significance in the difference between the pre-test mean scores of the experimental group ($m=114.59$)

and the control group ($m=111.65$). The obtained t of 0.46 with 32 degrees of freedom was found to be non-significant and so both groups may be presumed to come from the same population.

A t -test was subsequently applied to test for any significance in the differences between the means of the change scores for each group. The obtained t of 2.77 with 32 degrees of freedom is highly significant with a probability level beyond the 0.01 level of significance. Thus Hypothesis 3 is strongly supported namely that the Flying Start group will show a significantly improved score on the Maze V Tracking Test compared with the Control group. Given that the rationale behind this test is that a methodical, well planned and controlled attempt will be reflected in a low Tracking score then it is presumed that the Flying Start programme was effective in training children in such planning strategies.

The Porteus Maze V Tracking Test was developed by the investigator for the purposes of this investigation and the reasons for this have been discussed earlier. The Porteus Maze Test as described by Porteus (1965) also yields a test quotient. It was decided to apply a t -test to these data to test for any significance in observed differences in means. Although no hypotheses had been generated relevant to these quotients it was considered appropriate to subject the data to such analysis. Initially a t -test was applied to test if there was any significance in the difference of means on the pre-test scores of the experimental group test quotients ($m=81.65$) and the control group test quotients ($m=81.53$). The Porteus Maze Test Quotients for each subject are tabulated in Appendix E. The obtained t of 0.04 with 32

degrees of freedom was found to be non-significant. Again, the assumption is justified that we are dealing with similar populations.

A further t-test was applied to test for the significance of differences in the change scores of the experimental and control groups. The differences observed were found to be non-significant with t failing to reach the 0.05 level of significance ($t=1.73$ with 32 degrees of freedom). There may well be some difference but there is not enough assurance of it. It is arguable that this non-significant result is an artefact of the way in which Porteus reckoned the test quotients in the Maze Test. Inspection of the relevant table in Porteus (1965) namely Appendix D pages 306-307 reveals a very crude table in which chronological and test ages are given in half year intervals thereby producing quotients of doubtful value. One may conclude that whilst the Porteus Maze Test has undoubted value in a number of contexts its use as an instrument to calculate Test Quotient scores has an inherent insensitivity which precludes its use in such a way. Whilst no hypothesis was stated regarding the movement of Test Quotients by either group, given that such TQ's were derived from the test performance of subjects, it seemed appropriate to analyse the data. That no significant results were obtained is hardly surprising given the inherent weaknesses of this aspect of the Test's use.

In order to better understand the processes of behavioural change that might be occurring in a group of children exposed to a highly structured learning-to-learn programme, it was necessary to penetrate the statistical curtain and consider carefully the progress

of the Flying Start group over the two-month period. This "frame-by-frame" analysis takes the form of the presentation of case studies of the 17 subjects in the Flying Start group and forms the next Chapter.

CHAPTER 7

THE CASE STUDIES

Traditionally, the Doctoral thesis involves a reporting on the running of an across-groups experiment. There is no well established precedent for the presentation of the type of study attempted by the investigator. Accordingly an attempt was made to report on the work in such a way that a formal experimental design was incorporated into the evaluative process. Measures included in this analysis may be termed:

- A. The formative evaluation
- B. The "across-groups" evaluation

A. The method of formative evaluation demands that the programme itself be studied objectively as it is used with the subjects. The important features to be reported are changes in the programme along with progressive and final effects on the subjects.

In the present case, children at risk for learning disabilities were identified by a behaviour check list by which teachers indicated the extent to which faulty learning strategies were interfering with progress in the classroom. It was anticipated that children so identified who experienced the Flying Start programme would significantly after their problem solving approaches as compared with a control group. This change would be reflected in significantly improved behaviour profiles as recorded by teachers. A more refined analysis of the effects of the programme and one which allows the

evaluative process more scope is made through the presentation of individual case studies. This approach takes us through the statistical curtain and enables closer proximity to the data. This chapter is concerned with the presentation of such case studies.

B. The across-groups study may be considered as a parallel or complementary form of evaluation to that obtained through the formative evaluation. This comprises the analysis of standardised test scores, of behaviour profiles and problem-solving behaviours. This aspect of the study is described at length in Chapter 6.

In this section, seventeen case studies are presented representing the Flying Start or Experimental group. These seventeen children are the total number of the experimental population, themselves selected in the manner described earlier from the population of 165 Primary 1 children in the district of Tweeddale. Each case is identified by the child's christian name together with a letter/digit code. The ages given are those attained by the children at the end of the investigator's sessions with them.

By the way of summarising the information contained in the case studies, two six-point rating scales were devised (Appendix F). The first of these measures learning styles as demonstrated by the children in the groups with the investigator. The second is called an "adaptation scale" and reflects the way in which the children were reported by the teachers as having adapted to the classroom situation. These ratings are incorporated into Table 9 which attempts to outline some of the known facts about the "Flying Start" subjects.

In this table, the following definitions are used:

Behaviour Disturbance: maladaptation to the classroom situation as recorded by the Guide to the Child's Learning Behaviour and showing either "Under-reacting", Over-reacting" or "Mixed" behaviours.

Health or Developmental Handicap: only known defects of a handicapping nature were considered.

Neurological Disorder: only known disorders were considered.

Severe Cultural Disadvantage: only known disadvantage was considered.

Response to treatment: "rapid" response was judged as noticeable improvement in learning style occurring within the first three sessions.

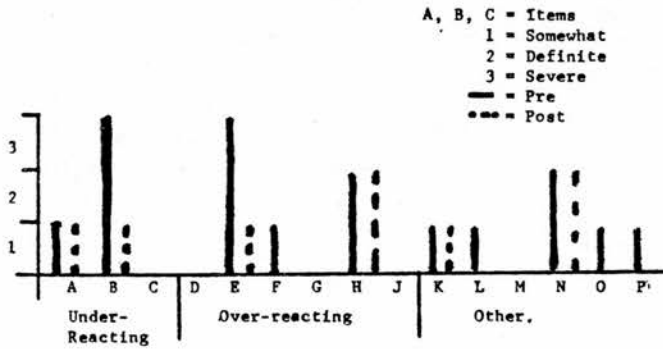
Scales of Learning Style and Adaptation to the Classroom: as used in the case studies. The former represents the investigator's judgement on a six-point scale (0-5) of the learning strategies demonstrated by the subjects at the close of the experiment.

The latter refers to the teachers' reports again on a six-point scale (0-5) on the manner in which the various children had transferred their learning skills to the classroom situation. These Rating scales are included as Appendix F. and were derived from work described by O'Neil (1978).

Freedom from signs of faulty learning behaviours: this is determined by a comparison of the pre and post test records made by teachers using the Guide to the Child's Learning Behaviour. The terms used are self-explanatory.

R.1

MICHAEL (Mixed) Aged 5 years 2 months



Prior to the commencement of the study, this child had been observed in the classroom on several occasions. He was of normal size, but rather pale and had noticeable difficulties in fine motor co-ordination, for example his manipulation of pencils and crayons was clumsy and he had difficulty in handling and constructing "Leggo" bricks. It was noted from the teacher's class records that Michael had been examined by a paediatric neurologist and that there had been a history of birth injury. In addition, Michael was the youngest child of a family of five noted for its difficulties, there being known family problems of unemployment and related poverty. It was further noted that Michael was not a particularly verbal child.

Because of the arbitrary nature of fixed-date admissions in the local education authority, Michael had started school at the age of 4 years 8 months. As a consequence, he was amongst the youngest of the class and was felt by the class teacher to be "too immature

and not yet ready for school". In terms of behaviour within the classroom setting, the class teacher reported a combination of behaviours which were extremely dependent at times when he was in sight of her (Category B) and a failure to concentrate for any length of time at any activity (Category E). To a lesser extent, Michael was reported to be adept at finding ways of avoiding anything that appeared to be taxing his abilities (Category H) and appeared not to try to focus his attention on the task at hand (Category N). The class teacher suggested that the demands even of the Primary 1 curriculum might be too much for Michael and that in addition the impoverished home environment conspired against him.

On the first session of the programme, it was necessary for the teacher to bring Michael to the teaching corner that had been set up in the open-plan area. He allowed himself to be placed at a table and slowly began to show interest in the activity of the group. It was fortunate that this group comprising four pupils included two acting out children (R2 and R3) who chattered away unceasingly, conveying the impression of enjoyment which proved sufficient to attract Michael.

Michael was given a 2-piece puzzle in Position B and asked to make a house. Somewhat seriously he completed this, and when asked what he had made, answered: "A house". These were the first words to the investigator. He was then given a series of the puzzles which were no challenge to him. When the 4-piece puzzles were being used, the verbal members of the group began to ask for different pieces of this set. Michael joined in and asked: "Could I have a train?"

The remainder of the experimental sessions over the weeks appeared to suit Michael very well. On occasions he demonstrated patience and teamed up readily with any member of the group. This proved to be useful because Karen (R3) was the hyperactive pupil in the group and the slow, painstaking approach of Michael to many of the tasks was something of an influence in containing her hyperactivity.

Throughout the initial sessions, Michael demonstrated often the dependent behaviour (Category B) reported by the class teacher. He would sometimes only tackle activities if the investigator were to be his partner and would "mope" if he were to be working with another individual. Frequently his lack of concentration (Category E) manifested itself in his failure to notice fine perceptual differences in the material as in the "Merry-go-rounds" and the "Mail Boxes". In the latter activity his initial efforts were characterised by random guesses which slowly changed to a more systematic and time consuming scrutiny of the cards. At this, he proceeded with confidence, deriving voiced pleasure: "I'd like to do the Post Office because I wasn't good at it and now I can do it."

The "Matchers" activity was one that proved to be difficult for Michael in the initial stages. His first attempts were "trial and error" and it appeared that he had little grasp of what the task called for. When this activity was produced Michael would try to find an excuse not to "play" (Category H). Gradually over a two-week period he developed a method of attack which involved careful scrutiny of the cards accompanied by a commentary:

"now/

"now it can't be that one because I've already taken it and I've done that one; it must be that one".

Subsequent attempts at this activity were noted for this strategy with accompanying vocalisation of his reasoning thus providing partial evidence that Michael was beginning to demonstrate systematic strategies of problem solving which paid off.

Michael's class teacher reported that his dependent attitude had been substituted by an appropriate response to the demands of the classroom, that he was communicating more freely and that he seemed to be much better suited to the classroom environment than previously.

On testing Michael's performances are reported thus:

Columbia Mental Maturity Scale:

Pre Test	Age Deviation Score	83	Percentile rank	14% tile
Post Test	Age Deviation Score	104	Percentile rank	60% tile

Of all the test procedures this alone produced a marked increase. In addition his performances were to be noted for, hesitancy, refusals to say or point in the pre test situation compared with a confidence and careful checking in the post test situation.

Porteus Maze Test

Pre Test	Test Age	5	Test Quotient	88
Post Test	Test Age	5½	Test Quotient	94

Pre Test	Maze Tracking Score	93
Post Test	Maze Tracking Score	94

The three scores derived from this test demonstrate no marked gains and inspection of the relevant first trials of the Year V Maze show tracks that were produced by a child whose grasp of the pen was clumsy and where the track was painstakingly completed.

(See Figure 21)

Discussion

Comment upon Michael's case depends largely upon the teacher's ratings on the Guide to the Child's Learning Behaviour and the improvement in the Age Deviation Scores on the Columbia Mental Maturity Scale. In the former, the class teacher records a significant reduction in behaviour Categories B and E. Though still slow and somewhat hesitant to answer or commit himself, Michael was no longer the excessively dependent child first reported. In addition he was able to permit himself fewer distractions although from time to time would still demonstrate a tendency to be caught up with what else was going on around him in the classroom. The teacher reported no change in behaviour categories H and N with Michael still tending to "shy away" from tasks that he perceived as difficult and easily losing concentration when "things got hard".

The qualitative evidence reported earlier in the case study suggests a pupil who has failed to acquire any adequate learning style other than various avoidance strategies. Over the period of the experiment, Michael slowly demonstrated that he was capable of approaching tasks effectively although with a strong passive element and that this did transfer to general classroom tasks with the

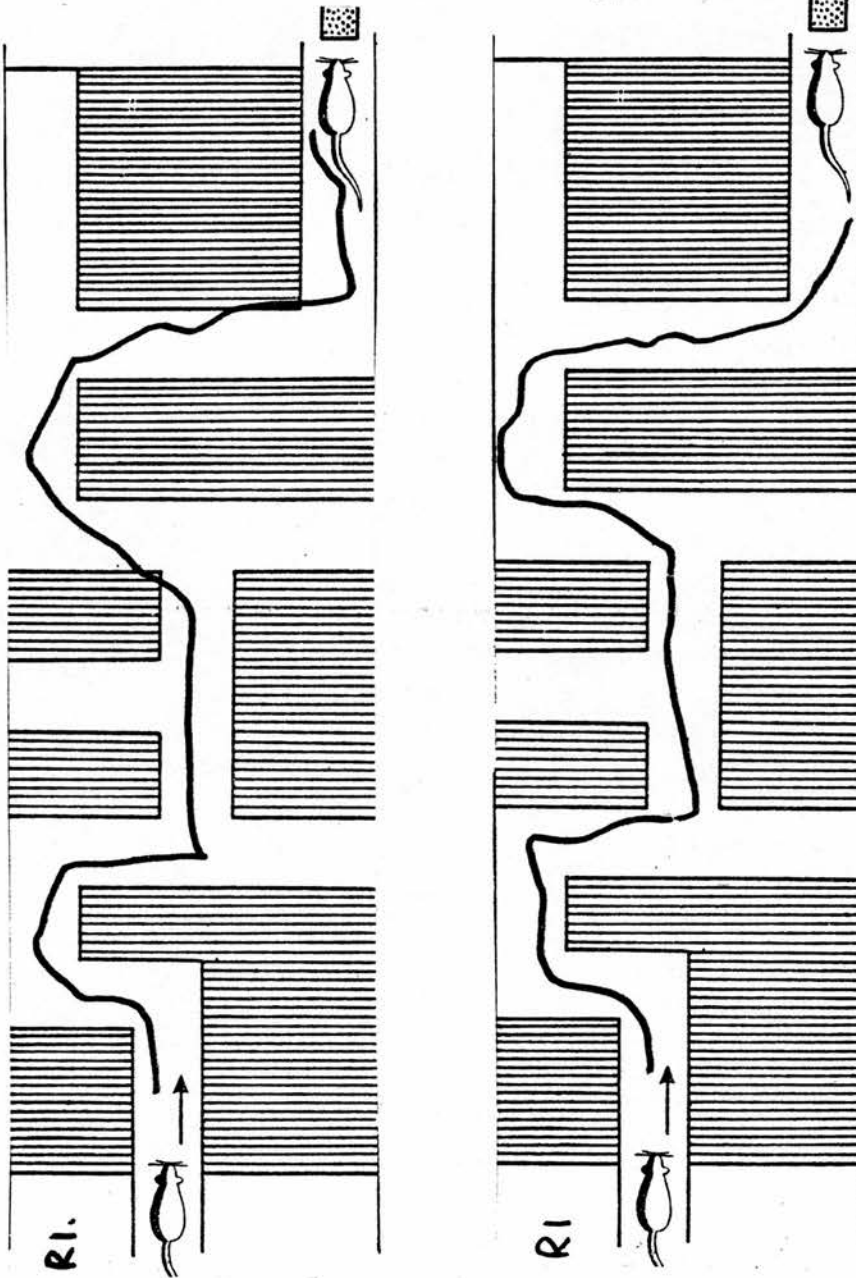


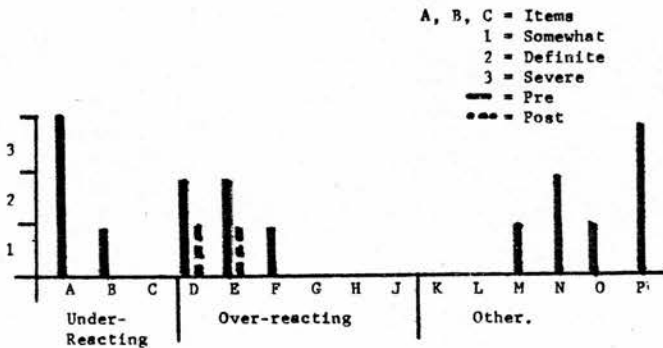
FIGURE 21
Pre- and Post-test Tracks for Subject R1

teacher commenting that for him: "things seemed to be beginning to click".

It is argued that Michael's background and suggested neurological problems worked against him initially and that the modest gains made indicated that he was capable of demonstrating effective learning strategies but still required carefully structured experiences reinforcing success to prevent him from regressing to ineffective behaviours. The marked improvement in both scores and approach to the Columbia Mental Maturity Scale strongly supports the view that Michael was capable of utilising effective strategies with success. Both the class teacher and the investigator were in agreement on their independent ratings of Michael's improvement in learning style and adaptation to the classroom.

R.2

CAROL (Mixed) Aged 5 years 2 months



Carol was an attractive girl who seemed in the classroom to be somewhat shy particularly when in contact with adults although she appeared to get on well with other children especially her older cousin Karen who, it was revealed after the experimental sessions had started, was her cousin. Karen (R.3) was also a member of the group and just as Carol was dominated by her in the classroom, so it was in the group. There were no known handicaps affecting Carol.

With adults, Carol was extremely shy. She froze when approached and would barely answer her teacher in a whisper (Category A). With other children she was less shy although she did not speak to very many. When given work to do, she was sometimes able to rise to the occasion but in open situations she tended to be distractible (Category D) and fidgeted about (Category E). Frequently, Carol was led into such over-reacting behaviours by her cousin Karen and would be easily

distracted by her so that her powers of concentration were of ten short-lived (Category N). The class teacher reported that frequently and to a marked degree Carol would insist and persist in going about things in her own way ; that despite frequent demonstrations she would continue with her own often unsuccessful procedures (Category P). It was obvious to the teacher that Carol was potentially quite competent but that the domination by her hyperactive cousin Karen and her impatience with the routines of learning were arresting her development as an efficient learner.

To begin with Carol did not speak to the investigator during the pre-experimental visits, although she smiled shyly from a distance and established eye contact. As the experimental sessions began, Carol came willingly enough to the teaching corner but seemed timid and apprehensive if she was not sitting alongside and working with her cousin Karen. On the first session Carol worked at the "Mail Boxes" and the "Merry-go-rounds". In the former she gained confidence after initial random attempts and soon developed a good systematic scanning strategy. Despite this she demonstrated the difficulty frequently encountered, that was created by the lack of any "up/down" cue on the face of the cards and protested vigorously holding a "b" card upside down :

"See that's the same as that (pointing to the 'q' on the Post Box) but Karen says I'm wrong and that she's won"

This was the most the investigator had heard her say.

At the "Merry-go-rounds" she had some difficulty being hesitant and afraid almost to commit herself.

The class teacher reported at the second session that during the intervening days Carol had frequently and on her own initiative gone to the corner and worked with the various activities deriving great pleasure from showing others in the class "her corner and her games".

By the third session Carol was less inclined to be working exclusively with Karen and happily co-operated with Duncan (R.4) at the "Mail Boxes" with her performance being markedly deliberate both as "sender" and "receiver". Her verbal responses in the small group were generally monosyllabic thus the investigator encouraged other children to fill in for her where stories on the "What's Happening?" games were required. Carol paid good attention to these stories and appeared to enjoy the communication with the other members of the group. By the end of the series, the teacher was reporting that Carol had appeared to drop her withdrawn behaviour and was willing to talk to her without embarrassment and was becoming quite animated.

Over the sessions it was apparent that Carol's dependence upon Karen was becoming reduced and that she was gaining in autonomy and self-confidence. It was becoming clear to both teacher and experimenter that Carol performed much better if she was separated from Karen who tended to take on custodial role too readily. Carol began to show initiative and would join more readily in group activities in the class having extended her network of friends. She still demonstrated a tendency to blindly guess whenever she met a difficulty and would sometimes be easily attracted away from the task at hand

(Categories D and E). The teacher reported that the insistence on doing things her way (Category P) was no longer evident.

Carol made gains on all tests following the experiment and these are reported thus:

Columbia Mental Maturity Scale

Pre Test	Age Deviation Score	80	Percentile rank	11% tile
Post Test	Age Deviation Score	90	Percentile rank	27% tile

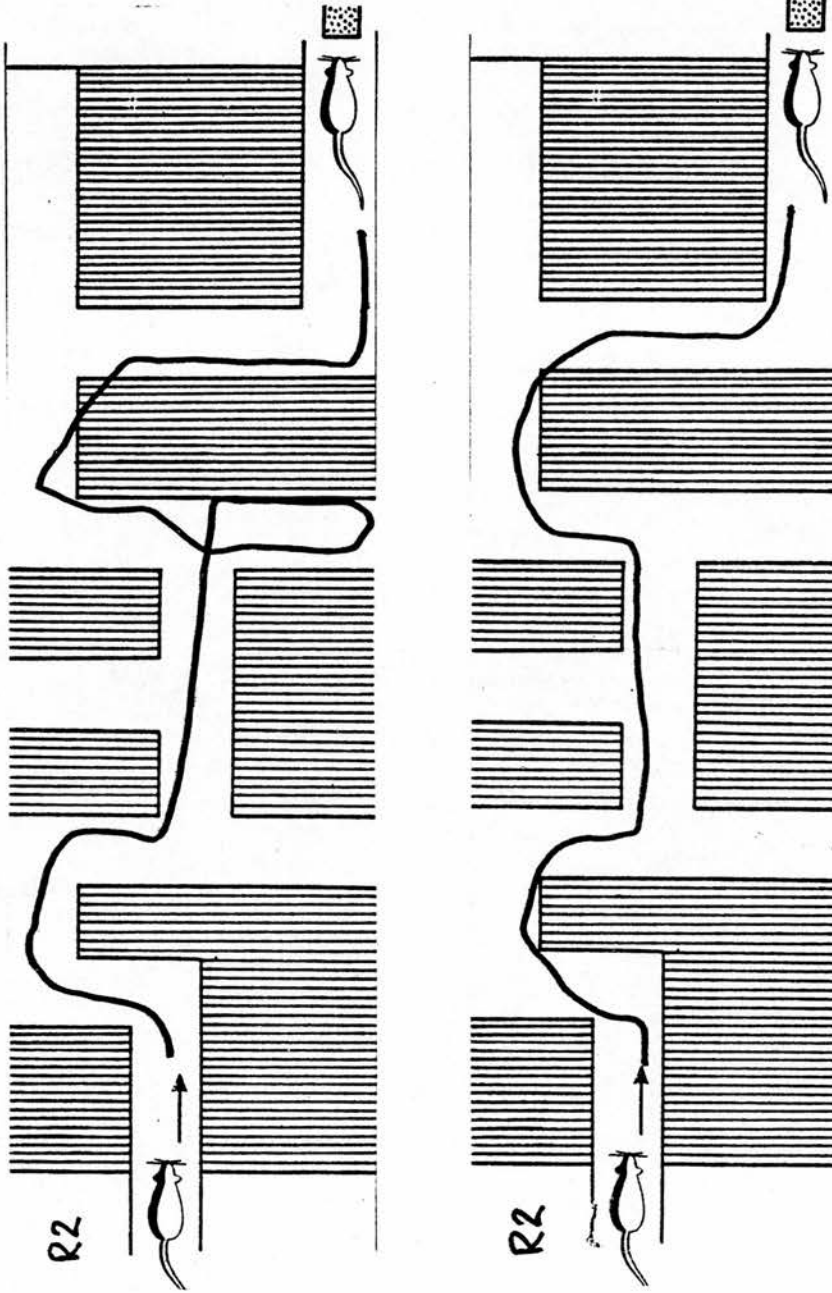
The testing sessions were marked by Carol's extreme shyness on the Pre Test. At no time did she talk to the investigator and her pointing was carried out with great hesitancy almost timidly. In the Post-Test there was a different Carol, willing to chatter, to ask questions and a seeking of assurances -

"I'm getting them right - I'm good, ain't I?"

Porteus Maze Test

Pre Test	Test Age	4	Test Quotient	76
Post Test	Test Age	5½	Test Quotient	92
Pre Test	Maze Tracking Score		119	
Post Test	Maze Tracking Score		83	

Inspection of the relevant Year V Maze reveals a marked improvement in the Post Test track with a bold execution free from blind alley entrances. (See Figure 22)



Pre- and Post-test Tracks for Subject R2

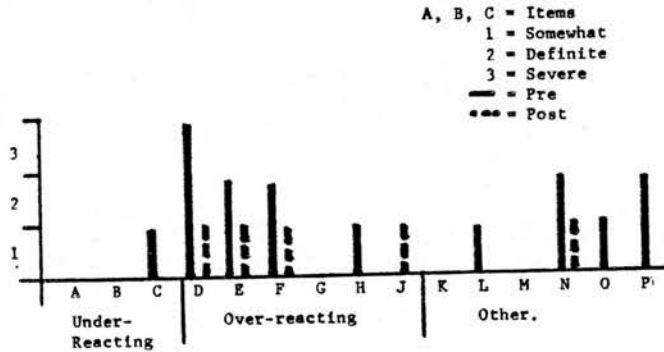
FIGURE 22

Discussion

Carol was able to take advantage of the highly structured sequential learning situation. Through it she was able to reveal a reflective, highly competent mode of adaptive behaviour which her teacher suspected was available. At her own speed, and without pressure, Carol emerged from her withdrawn shell and from the perhaps protective domination of her cousin Karen to proceed as a fairly normal child quite able to cope with the large open-plan classroom situation. Under these circumstances with adequate support Carol's unprofitable non-adaptive behaviours dropped away.

R.3

KAREN (Over-reacting) Aged 5 years 10 months



Karen was the older cousin of Carol (R.2) although this information was not known until the groups had been made up. She was an engaging, attractive girl, constantly chattering, never listening to what was being said to her or to the class. She had lots of friends in the class and took obvious delight in protecting and "mothering" her younger cousin Carol. The class teacher saw her as over-active, never taking time, always in a rush (Category D), always the centre of some classroom distraction (Category E) and a constant fidget, forever squirming when seated or wandering around the classroom (Category F). She also appeared to lose interest in the work which she was set and would often insist upon doing things her way (Categories N and P). Karen was an only child and there were no known handicaps that could be held to account for her hyperactivity.

Karen was not at all shy when visited and took to the experimental sessions surprisingly well. She rushed into the activities with great enthusiasm often with resultant confusion. At the "Merry-go-rounds" she would not wait her turn in the star-dot sequence thereby causing confusion. The initial sessions with Karen were characterised by her failure to inhibit primitive action impulses thus her problem-solving behaviour was of the trial-and-error variety. It was noticed, however, that in the second week of the experiment, i.e. after three sessions, Karen began to approach each activity with a degree of care, patience and seriousness that belied her profile. She began to co-operate more effectively with other members of the group although still showing a preference for Carol. Her teacher reported that in the class, she was noticeably more settled and was beginning to work productively. For example, her attack at "Matchers" was much more controlled - she would take the card given and painstakingly match, often double-checking until she effected her choice. It must be said that all this was accompanied by a continuous commentary which initially was on any topic but latterly became a commentary upon what she was doing. Similarly, the "6-piece animal pieces" were completed, often successfully, by a strategy that comprised careful edge-matching of the pieces.

Despite the marked improvement in her learning style, Karen's general approach still lacked a consistent reflectivity ; when this was absent her performance regressed to the impulsive, trial-and-error approach of the earlier sessions. This view was confirmed by the class teacher who commented that Karen's general classroom

performance showed an inconsistency. Though she was now demonstrating a new found competence in learning strategies she had not yet overcome her tendency to regress to ineffective behaviours. This showed itself in the post-test profile with Categories D, E and F still being present although reduced in degree of severity.

The results of the second diet of testing of Karen further reflect the improvements described in the foregoing qualitative evaluation of her performance.

Columbia Mental Maturity Scale

Pre Test	Age Deviation Score	81	Percentile rank	12% tile
Post Test	Age Deviation Score	97	Percentile rank	43% tile

In the pre-test situation Karen barely paid attention to the test cards and made her choices often by random pointing; rarely did she take time to scan and check. In the post-test things were quite different with marked eye movements indicating that she was making constant checks in each card and then only when satisfied would she make a choice. This characteristic improvement was also noticeable in:

Porteus Maze Test

Pre Test	Test Age	4½	Test Quotient	80
Post Test	Test Age	5½	Test Quotient	92

Pre Test	Maze Tracking Score	112
Post Test	Maze Tracking Score	92

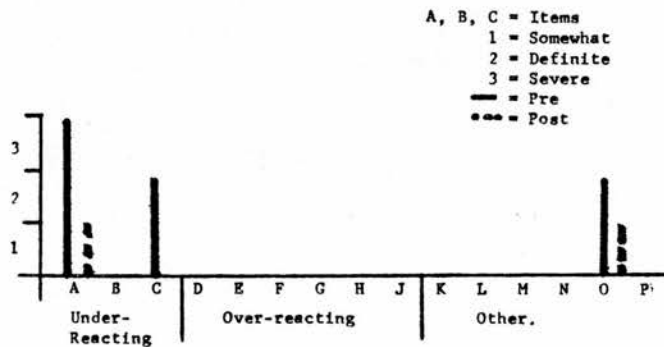
Inspection of Karen's tracks illustrates the improvement upon an attempt in which in the last third of the maze she gave up and promptly took the mouse through the "wall". This strategy incurred the penalty of 37 (described in Chapter 6) to be applied to her raw score of 75. Karen's post-test track is noticeable for its control. (See Figure 23).

Discussion

It became clear during the experimental programme that Karen was capable of performing in an highly effective manner although she had presented initially as being quite disorganised. The observed improvement reported above over the period suggests that Karen's inconsequent type behaviour was part of a preferred style which paid off in her general life style but only succeeded in short-circuiting the effective learning strategies that lay dormant. The success of the programme with Karen lay in the "rules" that caused her to have to inhibit the primitive action impulses which so characterised her earlier behaviour.

R.4

DUNCAN (Under-reacting) Aged 5 years 6 months



Of the four children in this particular group, Duncan was noted for his unforthcomingness. He was excessively shy and timid with the experimenter and was reported to be so with the class teacher. She found that it was very difficult to elicit any conversation from him, that he appeared frightened of anything new or demanding and that frequently he would burst into tears when under normal classroom pressures (Category A). To a lesser extent, he would persist in his own routines rarely attempting any variation (Category C) and often gave the impression of not appreciating what was required of him - he would sit uncomprehendingly at classroom tasks not making any attempt, responding only if the teacher or classroom aide were to sit with him even then, responses were at a minimal level (Category O)

Duncan appeared to be satisfied with a minimum to static level of competence and this reflected itself in a withdrawnness in general adaptation to the classroom that caused the teacher great concern.

There were no significant factors known as to Duncan's developmental history. He was the elder child of a family of two boys. The parents were known as a caring and concerned couple who had expressed anxiety at Duncan's slowness to talk as an infant and the articulatory difficulties that had been noted by both teacher and experimenter. No investigation of speech problems had been made at the pre-school level. The school, with the parents' permission had initiated a referral to the speech therapist but no action had yet resulted at or throughout the experimental programme.

At the beginning of the experimental programme the investigator experienced great difficulty in establishing any rapport with Duncan. This was but a continuation of the experience of the pre-testing sessions. Even with the least demanding of activities such as the 2-piece puzzles, Duncan would avoid any participation by sitting glumly, looking out of the window or pushing away the pieces. This behaviour persisted over the initial sessions with no changes in the pattern being observed. The "breakthrough" occurred via Karen (R3) who took it upon herself to look after Duncan. The interaction of these two was observed by the class-teacher who commented on, how Karen had never been observed in this constructive role before and how Duncan had appeared to respond to a class-mate for the first time.

By the fourth week i.e. after six sessions, Duncan was tentatively responding to simple activities. The "Merry-go-rounds" he played successfully, keeping to the star/dot rule, carefully checking the material but never uttering more than monosyllabic responses to questions nor maintaining any eye-contact. The first hint of any

animation occurred at the eighth session when Karen had a heated argument with Duncan that he had not checked one of her letters posted through the "Mail Box". He replied quite vehemently that he had and then proceeded to explain to Karen how he carried out the check finishing with a defiant - "So, there - I won". In many respects the pairing of Karen with Duncan was proving to be mutually beneficial - Karen's acting-out behaviour was being controlled by Duncan's diffidence, whilst the latter's unforthcomingness was being modified by the regular contact with the out-going Karen.

Towards the end of the sessions Duncan was becoming self-confident enough to be able to explain to the investigator the details of the "What's Happening" activity. In addition he was able to explain the rules of "Matchers" game to one of the group for whom this was a new activity. Furthermore his own performance both in the group and as reported by the class-teacher reflected a new found confidence which in general terms was somewhat inhibited but which for Duncan represented a major advance.

The most dramatic evidence of the noticeable gains in confidence and effectiveness are to be found in a consideration of Duncan's pre and post-test performances.

Columbia Mental Maturity Scale

Pre Test	Age Deviation Score	84	Percentile rank	16% tile
Post Test	Age Deviation Score	100	Percentile rank	50% tile

The qualitative aspects of his performance on this test are notable for a pre-test performance marked by frequent refusals and hesitant

pointing unaccompanied by any verbal comments. In the post-test situation there was a marked improvement upon the earlier hesitancy although he clearly still needed encouragement. The persistence of this diffidence or inhibition is reflected in the post-test profile on the Guide to the Child's Learning Behaviour where Category A is still recorded but at a reduced degree of severity.

Porteus Maze Test

Pre Test Age	3½	Test Quotient	76
Post Test Age	5½	Test Quotient	92
Pre Test	Maze Tracking Score	110 (arbitrarily assigned)	
Post Test	Maze Tracking Score	89	

The appended Year V Tracks for Duncan graphically illustrates the improvement in his performance over-time. In the pre-test situation having diffidently attempted the much simpler Years III and IV Duncan "froze" at the Year V Maze making only the initial effort shown. In the manner described in Chapter 6 he was arbitrarily assigned a Tracking Score of 110. His post-test track represents an highly competent performance. (See Figure 24)

Discussion

Stott (1969) in his analysis of maladaptive behaviour discusses a low level of effectiveness motivation as a possible cause of learning failure. It is argued that in Stott's terms, Duncan presented such a low level of effectiveness motivation. This handicap of temperament in Duncan's case interferred with his developing effective learning

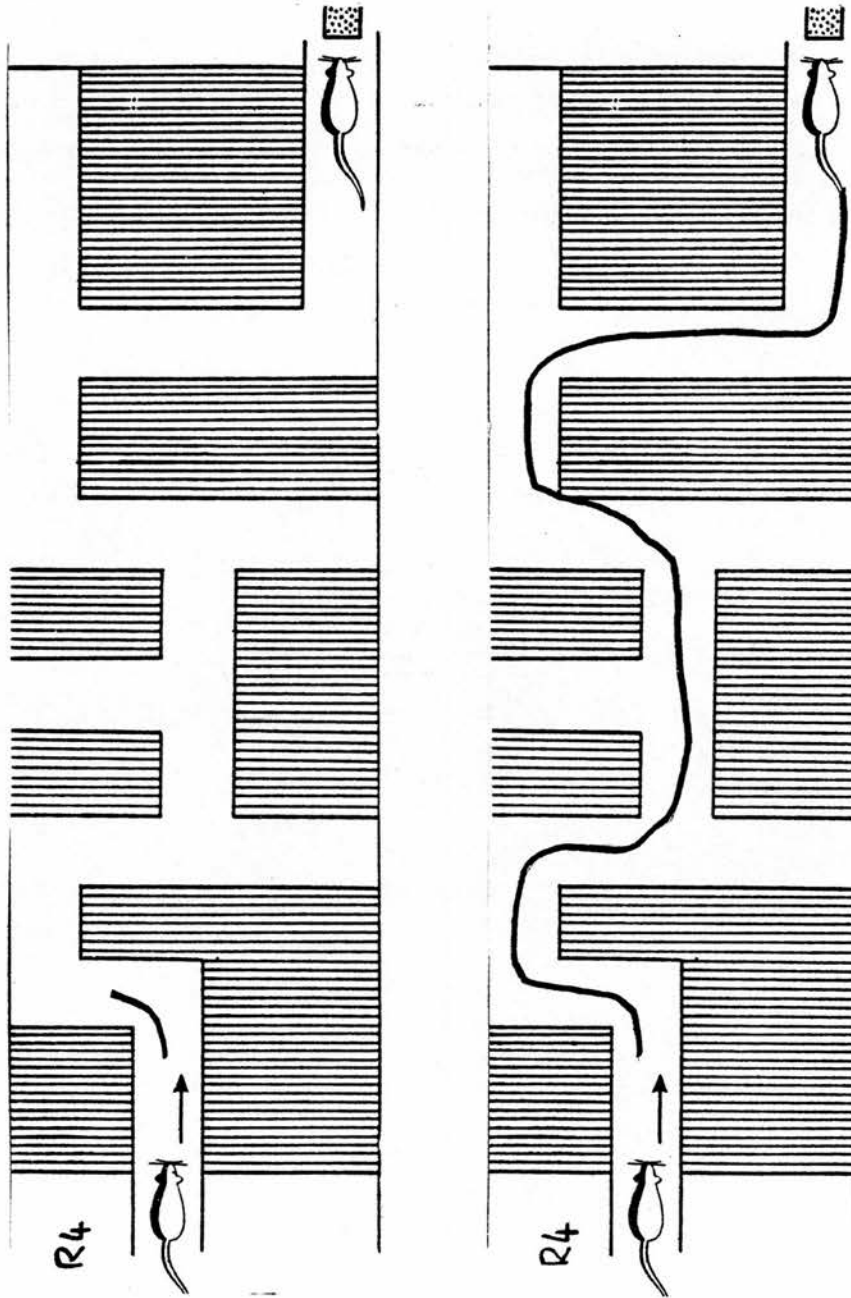
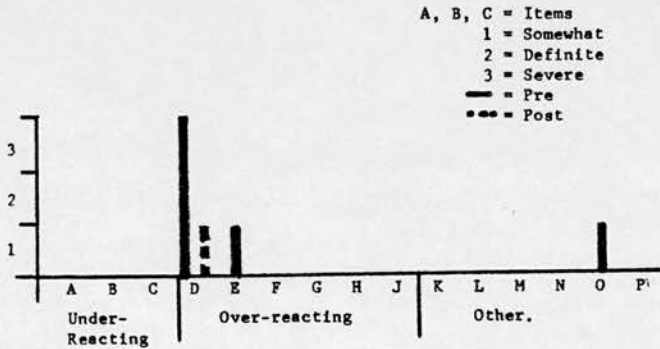


FIGURE 24 Pre- and Post-test Tracks for Subject R4

strategies. As a consequence, he presented a constellation of behaviours characterised by a static level of competence, in which he was satisfied often with minimal attempts at problem-solving. Placed in an environment in which these tentative attempts were reinforced, Duncan slowly gained in confidence. This case illustrates the point that a child, apparently unmotivated to operate in the classroom learning situation, has found it possible to move out of his state of withdrawal and inaction consequent to simple, graded but well defined meaningful successes.

B.5

HOPE (Over-reacting) Aged 5 years 4 months



Hope was a curly-headed, blonde child who presented something of a problem to the class teacher and to the investigator. She was described by the former as "perhaps a rather dull child" who was always difficult in class. She would race round the classroom during much of the school day, following the teacher, always demanding attention, never stopping to think before acting out (Category D). To a lesser extent she would easily become distracted by what was going on around her (Category E) and from time to time seemed to have difficulty in understanding what to do (Category O)

Hope always seemed to be too involved in her compulsive running around to take too much notice of the experimenter on her visits. At first she would run past shouting "Hello!" On later visits she would stop for a second to ask why the stranger was there. Then she would be off to another part of the room. In the testing situation Hope performed true to character. She was impatient of listening to

instructions especially in the pre-test situation on the Columbia. She would rush ahead on the task and then give up.

During the experimental sessions she was interested in the Flying Start materials from the beginning. She demonstrated some skill in putting together, without error, any of the puzzles presented to her. She would complete a puzzle, then rush around the room looking at everyone else's work. She worked so fast that it was impossible to check her work before she was away again. She was told that she could select her own work, but she would not do this, instead, she would ask for a drink of water, or to go to the toilet.

It was nigh impossible to bring these behaviours under partial control. Hope responded to being asked to help the investigator or another child and she learned to remain at the activity corner set aside during the sessions. She did not, however, settle for long enough in anyone period to become absorbed in the work, nor did she ever learn to switch activities on her own initiative. Nevertheless, in fragments of time, Hope successfully worked her way through all of the materials, sometimes showing genuine enjoyment.

Hope seemed to be at ease during the post-testing but only registered increases in her Columbia score. The class teacher credited her with a significant decrease on her behaviour profile but the investigator was of the opinion that the initial profile was somewhat flattering of the child and that on the basis of the eight sessions he had with her, there was little if any decrease in the hyperactive behaviours. Her test performances are summarised on the following page.

Columbia Mental Maturity Scale

Pre Test	Age Deviation Score	91	Percentile rank 29% tile
Post Test	Age Deviation Score	102	Percentile rank 55% tile

This alone of all the test procedures showed any increase. As described earlier, her pre-test performance was marked by an impatience and consequent failure to comprehend instructions. In the post-test situation her impatience was somewhat curbed, she did comprehend instructions and performed at an improved level indicating that the teacher's earlier estimate of her "dullness" was perhaps misjudged.

Porteus Maze Test

Pre Test Age	5	Test Quotient	88
Post Test Age	5	Test Quotient	88

Pre Test	Maze Tracking Score	97
Post Test	Maze Tracking Score	98

The attached record of Hope's Year V track reveals a track lacking somewhat in control although by no means immature. In view of her hyperactivity, both tracks are considerably better than what might have been expected. (See Figure 25)

Discussion

At the end of the experiment some enquiries were made concerning Hope's health. Her hyperactivity was so marked that both teacher and experimenter felt that medical opinion should be sought. The parents did not respond to the enquiry, so that no conclusions may be drawn in this regard. Hope appeared to be well co-ordinated, and

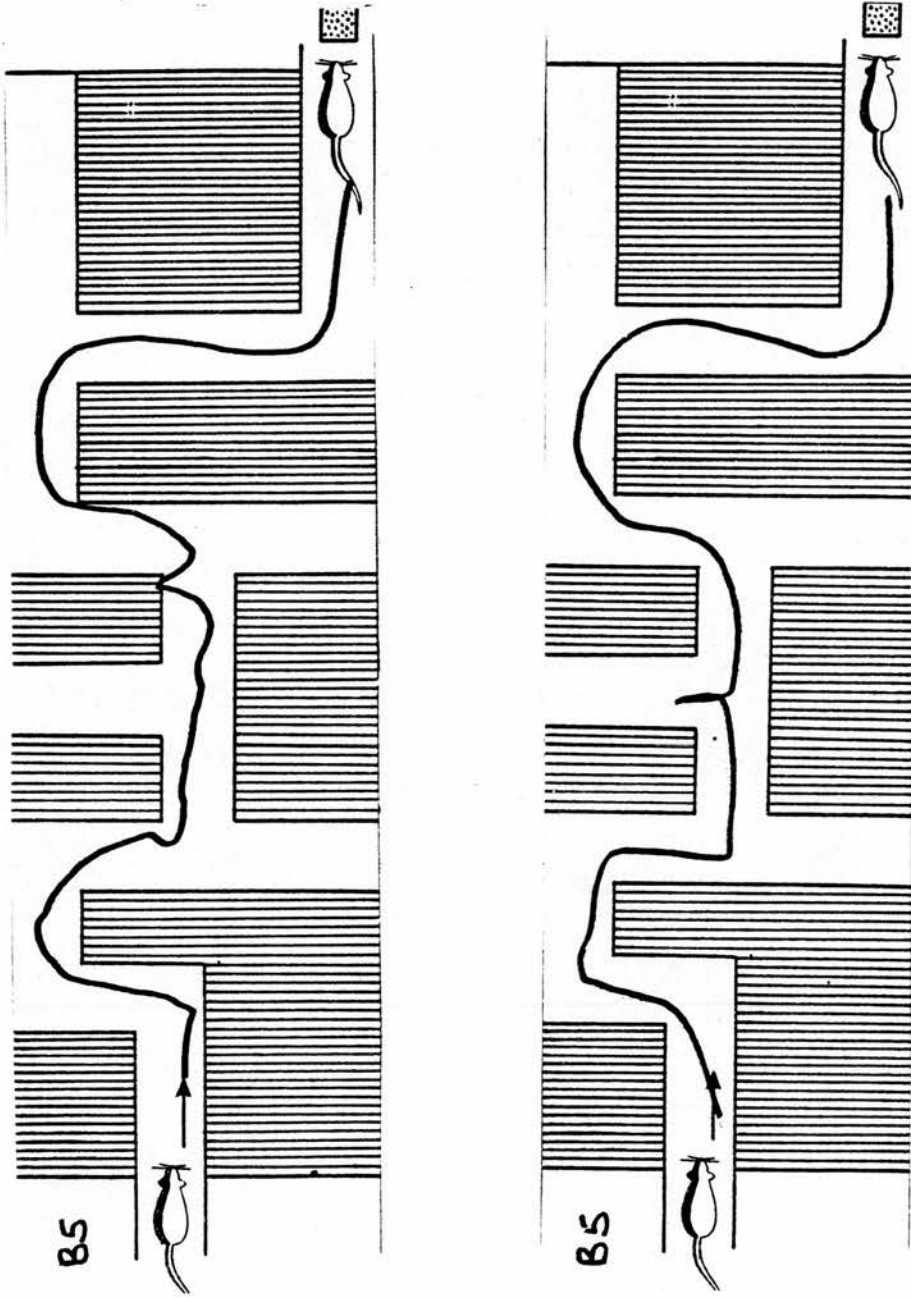


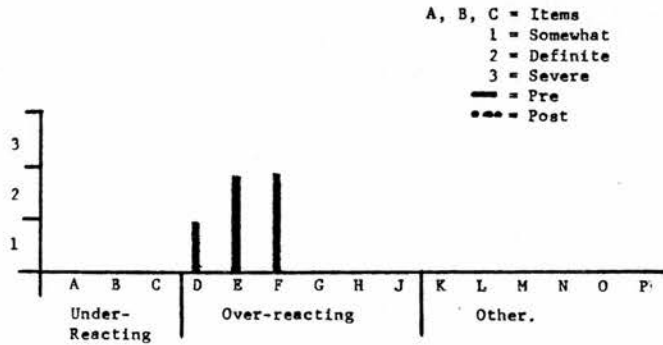
FIGURE 25 Pre- and Post-test Tracks for Subject B5

had demonstrated that she was potentially capable of academic development. The reasons for her extraordinary drive remain a matter for conjecture.

There is some evidence to show that the Flying Start programme assisted Hope in the development of her learning strategies, because following upon the series of lessons she was no longer able to pass off the impression that she did not understand the learning situations in her classroom. However, because Hope was spending much of her time in non-productive activity it must be conceded that for her the programme had no real force.

B.6

RICHARD (Over-reacting) Aged 5 years 11 months



Richard appeared to be a smiling, friendly handsome child when observed in the classroom. One would have also noted that he was full of fun. However, as the teacher was aware, this liveliness was leading Richard into behaviours which were not allowing him progress in classroom activities. He was somewhat impulsive (Category D) but to a greater extent was distractible (Category E) and fidgety (Category F). The experimenter found him friendly and co-operative although the hyperactivity and distractibility was clearly in evidence to a degree that caused the experimenter to consider that the classroom teacher tended to perhaps underestimate the behaviours of Richard and the other members of the B-group.

On initial introduction to the Flying Start programme, Richard showed difficulty in concentrating on his own activities by frequently getting up and going round the group to see what was going on. During the second week i.e. after two sessions he began to show interest in

the co-operative activities, particularly the "Mail Boxes". This caught his attention and proved to be highly satisfying to him. He resorted less to impulsivity and inattention and his penchant for clowning diminished in that situation. His work could not be described as careful but it was always completed with enthusiasm. The progress in Richard's attitude towards the various tasks over this short period was quite marked. He demonstrated a more developed form of reflectivity best illustrated by his efforts at the "Matchers" activities which he tackled by verbalising his reasons for choice and rejection.

In the classroom, Richard's behaviour changed slowly for the better over the eight weeks. He was reported as becoming calmer, co-operative, more settled to work so that at the end of the experiment the teacher was satisfied with his total approach to the learning situation. In this latter respect the teacher and experimenter were in close agreement in their ratings of Richard's improvements. It must be stressed that only the behaviour profile shows significant improvement, the formal testing revealing only small gains.

Columbia Mental Maturity Scale

Pre Test	Age Deviation Score	90	Percentile rank 27% tile
Post Test	Age Deviation Score	104	Percentile rank 60% tile

Noticeable on Richard's performance on the Columbia was his more inhibited approach in the post-test situation with eye movements consistent with his checking before making his selection - this accompanied by a verbal explanation for his choice.

Porteus Maze Test

Pre Test	Test Age	5½	Test Quotient	92
Post Test	Test Age	6	Test Quotient	96
Pre Test	Maze Tracking Score		97	
Post Test	Maze Tracking Score		91	

Richard's tracks on the Year V Track evoke no particular comment save for the angularity of execution. The completion of the tracks was completed in each of the sessions by fairly rapid and well controlled strokes. (See Figure 26)

Discussion

Richard responded well to the small group situation in which any positive approach to pre-arranged and well ordered work was immediately reorganised and accepted. This child was able to appreciate order and sequence and felt sufficiently rewarded by operating within this framework. It is possible that he may have profited by the freedom from competition in the small group, certainly Richard showed an ability to appreciate praise and constructive assistance so that he was successful in transferring his new skills in a confident way to meet the needs of the classroom.

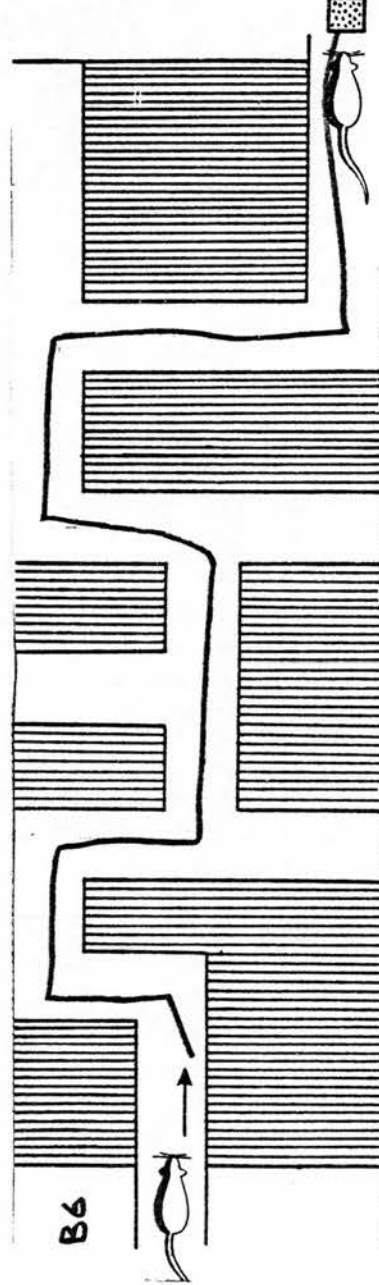
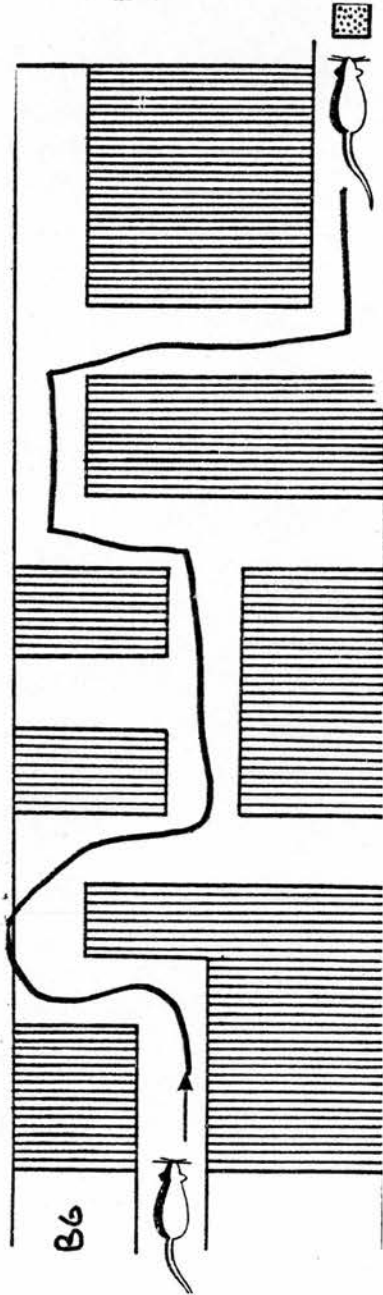
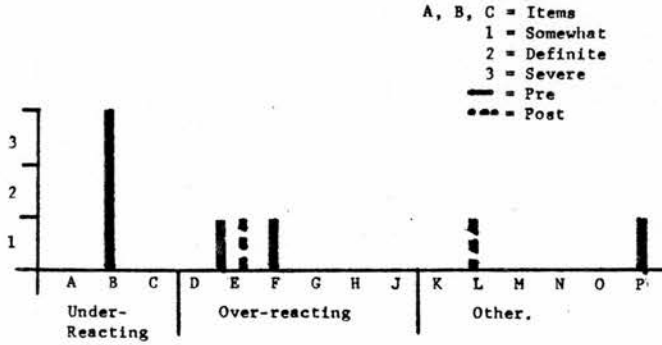


FIGURE 26 Pre- and Post-test Tracks for Subject B6

B.7

EVELYN (Under-reacting) Aged 6 years 3 months



Evelyn was an undersized 6 year old, older than the average Primary 1 child in respect of her starting school a year later than normal. From birth she had been a child in very poor health and prolonged hospitalisation resulting in surgery had caused her delay in starting school. She was an only child of farming parents who lived well outwith the town where the school was. If anything Evelyn would be found in an ineffective condition in the classroom. She would perhaps be standing by some piece of equipment, but was never using it, nor was she playing with anyone. She had an air of apprehension about her ^{her} enormous round eyes ^{the} being most prominent feature of her ever serious face. She did not seek the attention of anyone, adult or child, but would go along with requests such as sitting down with a group, although it could not be said that she co-operated in any activity. She gave the impression of being quite helpless (Category B).

As a visitor in the first instance, the investigator made overtures to Evelyn in an attempt to gain her confidence. The result seemed to be that the child stared in a frightened manner at this stranger. At the time of testing she still appeared nervous but despite that was able to score at an acceptable level.

On the first day of the experimental sessions, Evelyn allowed the experimenter to take her hand and lead her along with the others to the work area. She was shown a place at the table and sat down with the group. She was given the 2-piece doll puzzle in Position A, and told to make a doll. Evelyn made no attempt to touch the material. Her hands were placed on the table by the investigator and a further request for action was made. She moved the pieces, completing the puzzle and waited. She was asked quietly, "What did you make?" and she answered very quietly, "A dolly", and smiled faintly.

From then on, Evelyn worked through all positions of the white puzzles and was quickly ready to work with Hope (B5) the other girl in the group. As her profile reflects, Evelyn moved forward consistently and at the end of the sessions was not only integrating well with the group but with other children in the classroom. Whilst she was still diffident in conversation, being unforthcoming and still tending to be withdrawn, she did tackle the materials with increasing confidence. Frequently she displayed her pleasure at success by the faint smile that the experimenter had first seen at the initial session. On post-testing, Evelyn showed gains thus:-

Columbia Mental Maturity Scale

Pre Test	Age Deviation Score	90	Percentile rank 27% tile
Post Test	Age Deviation Score	108	Percentile rank 69% tile

This test was noted for her marked reluctance in the pre-test situation to attempt any choice compared with a careful and studied scrutiny in the post-test situation.

Porteus Maze Test

Pre Test	Test Age	5½	Test Quotient	90
Post Test	Test Age	6	Test Quotient	96
Pre Test	Maze Tracking Score		92	
Post Test	Maze Tracking Score		89	

On post-testing, Evelyn gained six months on her Porteus Test Age without showing any measurable change in her Year V Track, both pre and post tracks being completed with economy. (See Figure 27)

Discussion

Evelyn showed a readiness and an ability to function and develop in a structured situation by firstly performing adequately in the testing session and then following this up by increasingly good performance in the group sessions.

This case illustrates the point that a child, apparently unmotivated to operate in the classroom has found it possible to move out of her state of withdrawal and inaction, consequent to simple, graded but well defined and meaningful successes where the smallest effort on the part of the child is likely to produce success.

It is to be noted that Evelyn came from a teacher who, after the second week of the experimental sessions, noted several vital changes in the strategies of the four children in the experimental

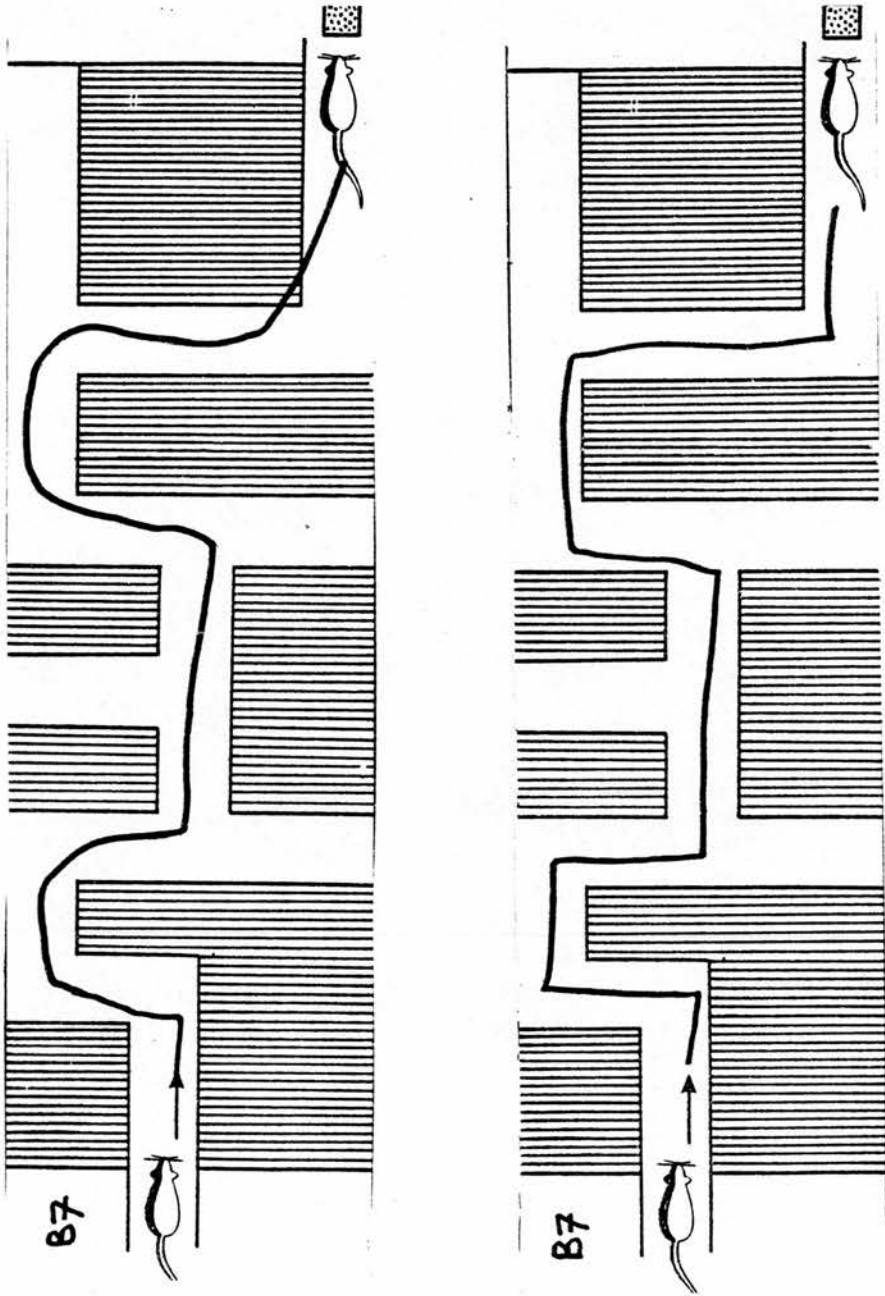


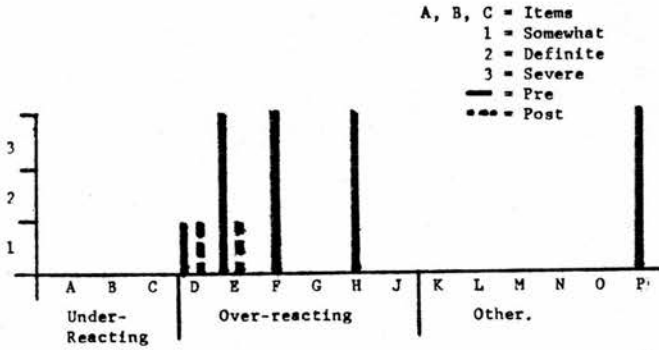
FIGURE 27 Pre- and Post-test Tracks for Subject B7

group. This teacher posed such observations to the investigator as, "What have you done to _____? He is taking time to think! These children want to know 'Why' all the time and 'What's happening'. They are always asking questions". She proceeded to alter her classroom teaching to cater for the changes which she understood to be beneficial to the children.

One lesson to be learned from this incident might be that an highly intelligent and observant teacher will permit her children to make the greatest immediate gains from their own experiences where these are obviously relevant to the learning process. She will be so unself consciously flexible as to change her own approach wherever she sees there is value in doing so.

B.8

JOHN (Over-reacting) Aged 5 years 4 months



John was a short, chunky tornado. Never still, he spent a lot of his time charging around the room in what seemed an aimless manner (Category F). On very infrequent occasions when he was able to co-operate, John showed signs of ability (Category P) but these occasions were so rare that the teacher was unable to capture his motivation and attention. John made his teacher's job very difficult; apart from trying to recover him from frequent excursions outside the room, she could not predict his behaviour and therefore had no way of preventing its occurrence. John did not seem to have many friends. He found it difficult to play with other children, preferring to interfere with the activities of others (Category E) distracting them with his silly clowning (Category H).

John was very interested in the investigator's visits to the classroom. He always approached and questioned him in a loud voice. In the testing situation he was happy enough to take part but did not listen to instructions, frequently set off on various ploys and

had to be drawn back to the task at hand.

At the beginning of the group sessions, John was over anxious to go to the corner. On the first session the work is individual and he coped very well, working on the 2 and 4-piece puzzles with good style. He stayed in his seat long enough to complete five puzzles, with which he was obviously pleased. On the second session, some co-operation with another child was demanded of him, to which he reacted anxiously after a little time. Not yet showing any tendency to reflect, he was extremely impatient of being taught a sequential co-operative game such as "Merry-go - rounds", and took to roaming around the room, attempting to disrupt the work of others. He finally allowed the investigator to work with him, and gained obvious pleasure out of the game under these conditions.

The third session was not smooth. A weekend separated sessions two and three, during which time John appeared to have become very unsettled. He was hostile from the outset, and began by throwing materials around the room. When requested to pick them up, he screamed and threatened to tear them up. Clearly he was stressed, so he was made the teacher's helper for a little while and settled down somewhat. Later, John rejoined the group working with the investigator but quickly gave up and threw the materials around as he went to work with another child. The investigator announced to the group that John would not be allowed to join them any more because he did not want to. John threatened to leave and was told that was alright if he did not want to come back. He asked for more games, and stayed with the group. In general classroom work, the teacher was reporting that there was no

hint of change in John. He could still not handle the open-play situation, and was having out bursts of temper and destructiveness.

The fourth session was not much better than the third although it was becoming clear that John was capable, a fact which could no longer be hidden. He could complete "Merry-go-rounds", and play "Mail Boxes" without error. It was when the "What's Happening" game was introduced that John's attention was captured and held. During the next three sessions John began to show good improvement. He had no more tantrums in the small group. He was impatient but his achievement level shot up sharply, as he attempted to perform all the games. He had begun to listen to instructions, and even though he was not able to co-operate well with anyone child in the group, he learned to work with some patience with the investigator and, in addition his work became careful.

John's various test scores are tabulated below. Only the post-test profile on the Guide to the Child's Learning Behaviour reveals any significant change, reflecting the changes in behaviour over time as reported above.

Columbia Mental Maturity Scale

Pre Test	Age Deviation Score	84	Percentile rank 16% tile
Post Test	Age Deviation Score	94	Percentile rank 35% tile

Both pre and post test performances on the Columbia were characterised by failure to listen to the instructions; random guessing; frequent changing of mind and a generally high level of distraction. In the post-test situation there was evidence of control but this was not marked.

Porteus Maze Test

Pre Test	Test Age	5½	Test Quotient	94
Post Test	Test Age	5½	Test Quotient	94
Pre Test	Maze Tracking Score	98		
Post Test	Maze Tracking Score	102		

This test reveals no noteworthy improvements in performance with the post-test tracking score actually showing an increase. The appended Year V tracks indicate a successful performance on both occasions with no lapses. (See Figure 28)

Discussion

John's performances in the experimental group never became absolutely perfect, although his work with the materials was executed with great skill and care, considering his reported pattern of over-active behaviour. He was able to complete all the work in the kit except the blue "Matchers".

John's post-test behaviour profile shows that many behaviours which had previously crippled him in learning situations had fallen away. His teacher was expressing great relief, since he no longer required so much of her attention. He was able to spend his time in more constructive work and play and his temper outbursts had ceased.

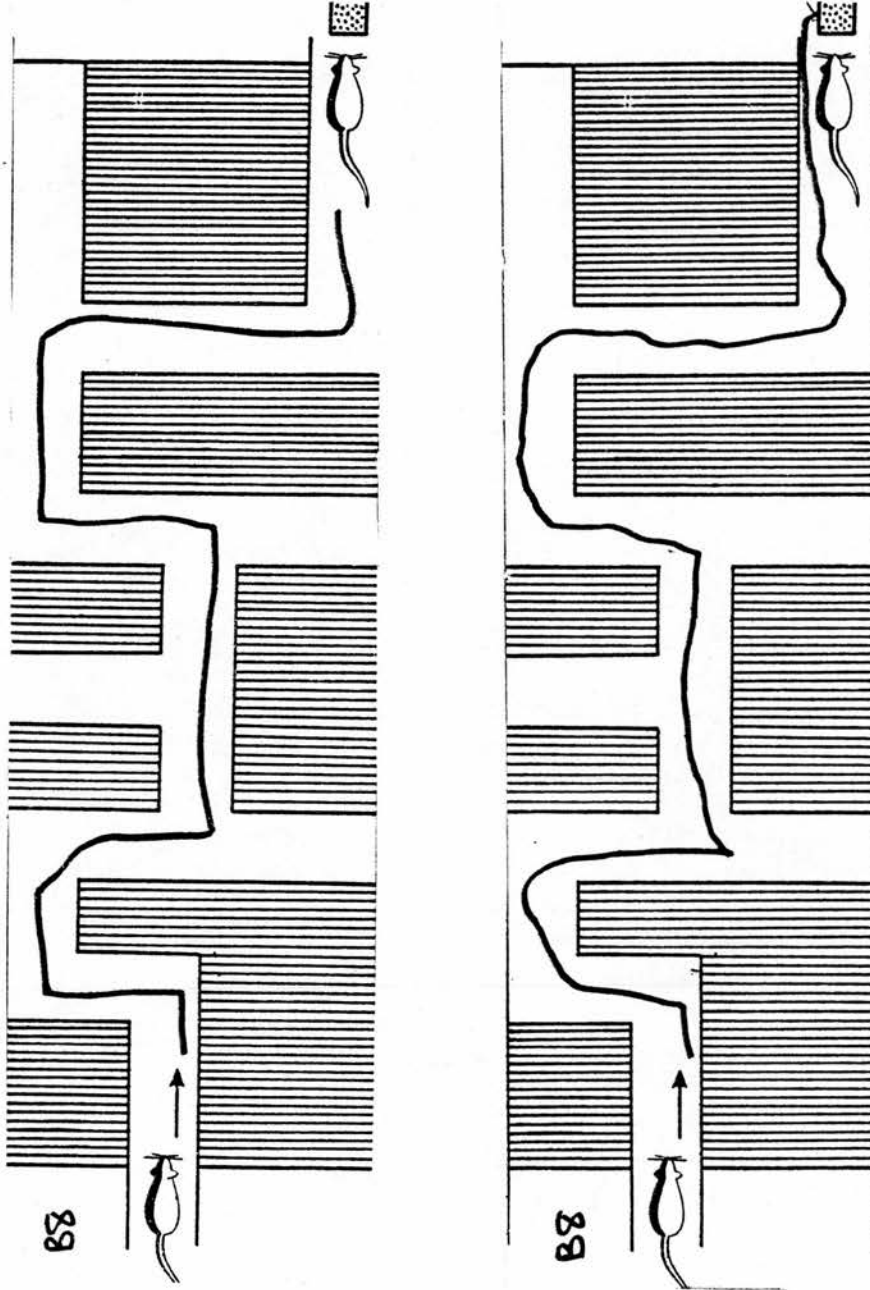
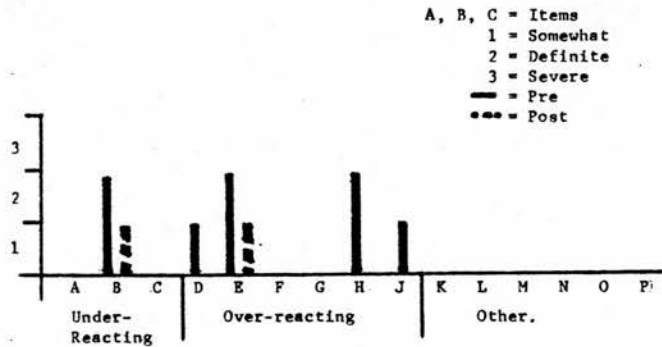


FIGURE 28 Pre- and Post-test Tracks for Subject B8

P.9

LAWRENCE (Over-reacting) Aged 5 years 5 months



Lawrence appeared as a smiling, friendly, attractive girl in the classroom. However, as the teacher was aware, her general style was leading her into behaviours which were not allowing her to progress in the classroom. She was impulsive to a limited extent (Category D), distractible (Category E) took great delight in disrupting the work of the class by clowning (Category H) and to a lesser extent, seemed not to care ever about being wrong or failing (Category J). Perhaps, because of this she succeeded in creating the impression of being a somewhat dull child (Category B).

In addition to these behavioural characteristics reported by the teacher, it was also known and verified that Lawrence had a language problem being the offspring of a mixed Belgian/English speaking marriage. The family comprised two other younger siblings and was itself a somewhat confused setting. Father had deserted the family leaving the Belgian speaking mother (with limited English) as the

only permanent figure in the home. Social work support was being provided for this family which was considered to be "at risk".

Lawrence had always been somewhat shy but co-operative towards the investigator. She continued with this pattern of behaviour for the first two or three sessions. She showed a difficulty with the 4-piece puzzles appearing to have a limited grasp of what was involved and consistently got them wrong. In contrast to this was her meticulously correct control whilst playing the "Merry-go-rounds". In this activity she co-operated well. By the fourth session Lawrence had overcome her shyness towards the experimenter and in the small group was beginning to present some of the disruptive behaviour reported by the class teacher. Whilst working with other children in paired activity she would sometimes sweep cards off the table or get up and disturb another pair. The experimenter worked with Lawrence at the "Mail Boxes" at which she progressed satisfactorily. She resorted less and less to impulsivity and inattention and her clowning behaviour diminished.

At the "What's Happening?" activities Lawrence had difficulty in verbally describing the depicted sequence despite successfully building up the sequence. This reflected her language difficulties referred to earlier and it was noticeable that in this context her inappropriate behaviours increased. By the end of the experimental sessions, Lawrence was still presenting difficulties in the verbal component of this activity but had succeeded in giving adequate descriptions for the earlier items in the series.

Lawrence's general approach to the materials could not be described as careful, but it was always completed with enthusiasm and the progress in her attitude towards work over this period was quite marked. Over the eight-week period, her behaviour in class changed slowly for the better. She was reported as becoming calmer, co-operative and more settled in her work so that at the end of the experiment, the teacher was satisfied with her total approach to the learning situation. This general improvement is further reflected in her post-test behaviour profile, as well as in the test performances.

Columbia Mental Maturity Scale

Pre Test	Age Deviation Score	90	Percentile rank	27% tile
Post Test	Age Deviation Score	102	Percentile rank	55% tile

The pre test performance was marked by "wild guessing" and lapses of concentration which contrasted with a careful systematic scrutiny on post-test:

Porteus Maze Test

Pre Test	Test Age	4½	Test Quotient	82
Post Test	Test Age	5½	Test Quotient	92

Pre Test	Maze Tracking Score	112
Post Test	Maze Tracking Score	107

The relevant Year V tracks demonstrated a greater degree of control in the post-test performance than what existent in the pre-test. (See Figure 29)

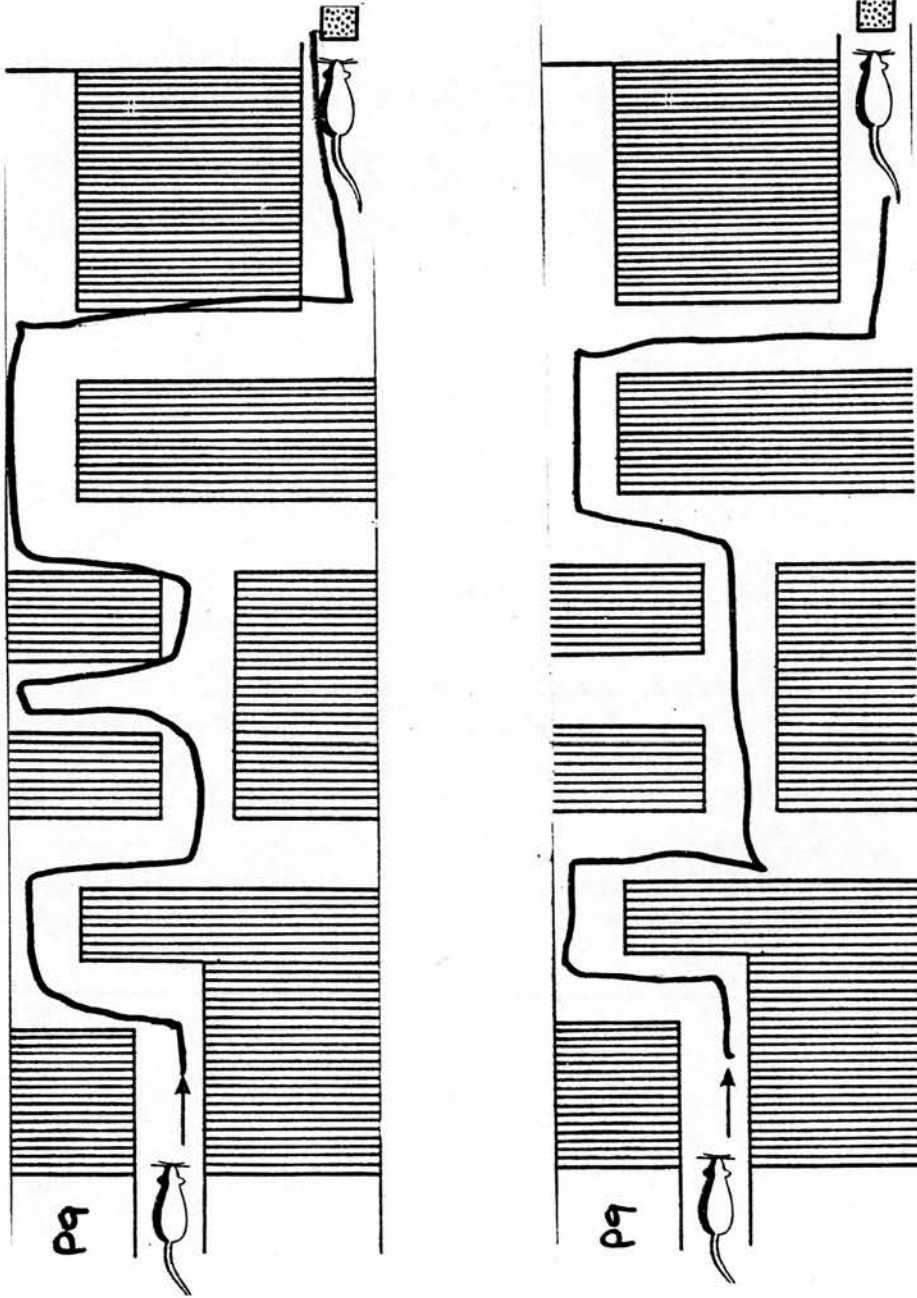


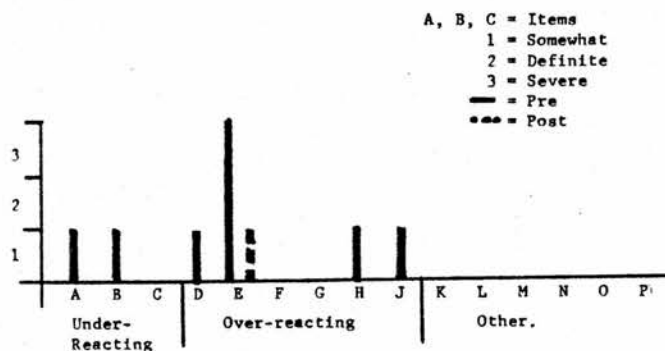
FIGURE 29 Pre- and Post-test Tracks for Subject P9

Discussion

Lawrence responded to the small group situation in which trial and error, guesswork was not reinforced. She was able to work well at structured tasks and though somewhat handicapped in verbal ability began to co-operate well with other children in the group. She was still operating at an inconsistent level but nevertheless did inhibit primitive action impulses. successfully and demonstrated a degree of reflectivity. All of this lends support to the view that in Lawrence a combination of handicapping events in her cultural setting had locked her into a behaviour pattern that was unproductive in the learning situation. With continued supportive help on language activities, there was evidence that Lawrence should be able to capitalise upon her abilities.

P.10

LINDSAY (Over-reacting) Aged 5 years 5 months



Lindsay was a small, attractive girl, the only child of caring parents. She struck the investigator initially as a somewhat anxious child, nervous of strangers, whom she watched quizzically from a distance. Her teacher described her as something of "a baby" who would sometimes cry (Category A) and be very slow in responding (Category B). These behaviours were less worrisome than the high degree of distractibility reported by the teacher (Category E). She felt that Lindsay was otherwise of good ability but that her lack of concentration and general distractibility prevented any significant achievements. There were no known handicaps or difficulties as far as Lindsay was concerned.

Lindsay did not become friendly with the investigator during his visits to the classroom. She seemed too shy to speak or to smile but gazed seriously at the visitor. It was difficult to achieve any rapport in the testing situation, not just because of the child's

reserve but also because Lindsay would not concentrate at the task in hand. Initial judgements made by the investigator suggested that she was work shy, but this was not borne out in the experimental sessions.

From the start of the sessions, Lindsay was attracted to the materials and showed great interest in them. She appeared to listen to instructions and certainly acted upon them. She worked swiftly at the 2 and 4-piece puzzles, and between finishing her own work and receiving more she would move around the room to watch and often annoy others at work. Lindsay appeared not to feel the need for constant approval but clearly she required to be engaged on productive work or she would disrupt others. As soon as it was clear that she could work independently she was encouraged to select a new activity and shown how to work at it. With this independence, Lindsay became something of a trouble-maker, constantly selecting activities but only half completing them so that the investigator found it necessary to monitor her work himself.

Lindsay found it difficult to work on the "Merry-go-rounds" because of her tendency to be impatient. She would become engrossed in the materials that were before her, but quickly she would give up, sometimes cry and be distressed when she attempted to solve puzzles alone which required the collaboration of two persons. Whenever the investigator offered help, she was able to master the problem of taking her turn.

This difficulty in co-operative activity was clearly demonstrated in her work with the materials. The activities that required collaboration

for example, "Matchers" or "Mail Boxes" were quickly given up. It was observed that a key to this problem lay in Lindsay's ability to "see ahead" the solution and so would become impatient with her partner and would not wait for that turn to be played. The investigator took over the role of Lindsay's partner and after three or four sessions working at the problem of taking turn, observed that her patience was in greater control. In these sessions too, Lindsay's mask of diffidence slipped away as she became chatty and quite confident in all her work.

In classroom activities, the teacher reported that she found Lindsay to be more controlled and less impatient and that it was becoming possible to pair her up with other children in various activities. The teacher also commented that her earlier belief in the child's level of ability was now being vindicated and that she was now demonstrating more age-appropriate abilities than previously. This reported improvement is supported by increases in her test scores with the exception of the Maze Tracking test.

Columbia Mental Maturity Scale

Pre Test	Age Deviation Score	93	Percentile rank 33% tile
Post Test	Age Deviation Score	106	Percentile rank 65% tile

The only noteworthy aspect of the two performances is that in the pre-test Lindsay quickly became disinterested, ceased any careful scrutiny of the materials and resorted to random pointing. This pattern of behaviour was absent in the post-test.

Porteus Maze Test

Pre Test	Test Age	4½	Test Quotient	82
Post Test	Test Age	5½	Test Quotient	92

Pre Test	Maze Tracking Score	99
Post Test	Maze Tracking Score	101

The Year V tracks display no qualitative differences save that it is to be reported that Lindsay's execution of the post-test track was dashed off with a sense of - "this is too easy for me". (See Figure 30)

Discussion

Lindsay's reported distractible behaviour appeared to derive itself from her difficulties in working co-operatively with other children. The rapidity with which she improved in both the experimental sessions and in classroom activities strongly suggests that she had never effectively acquired collaborative skills of the sort that are required in the contemporary infant classroom. The Flying Start materials provided that degree of structured, shared activity that allowed Lindsay to develop confidence and competence in working with others. In the course of two months her tendency to disrupt rather than co-operate with others significantly subsided.

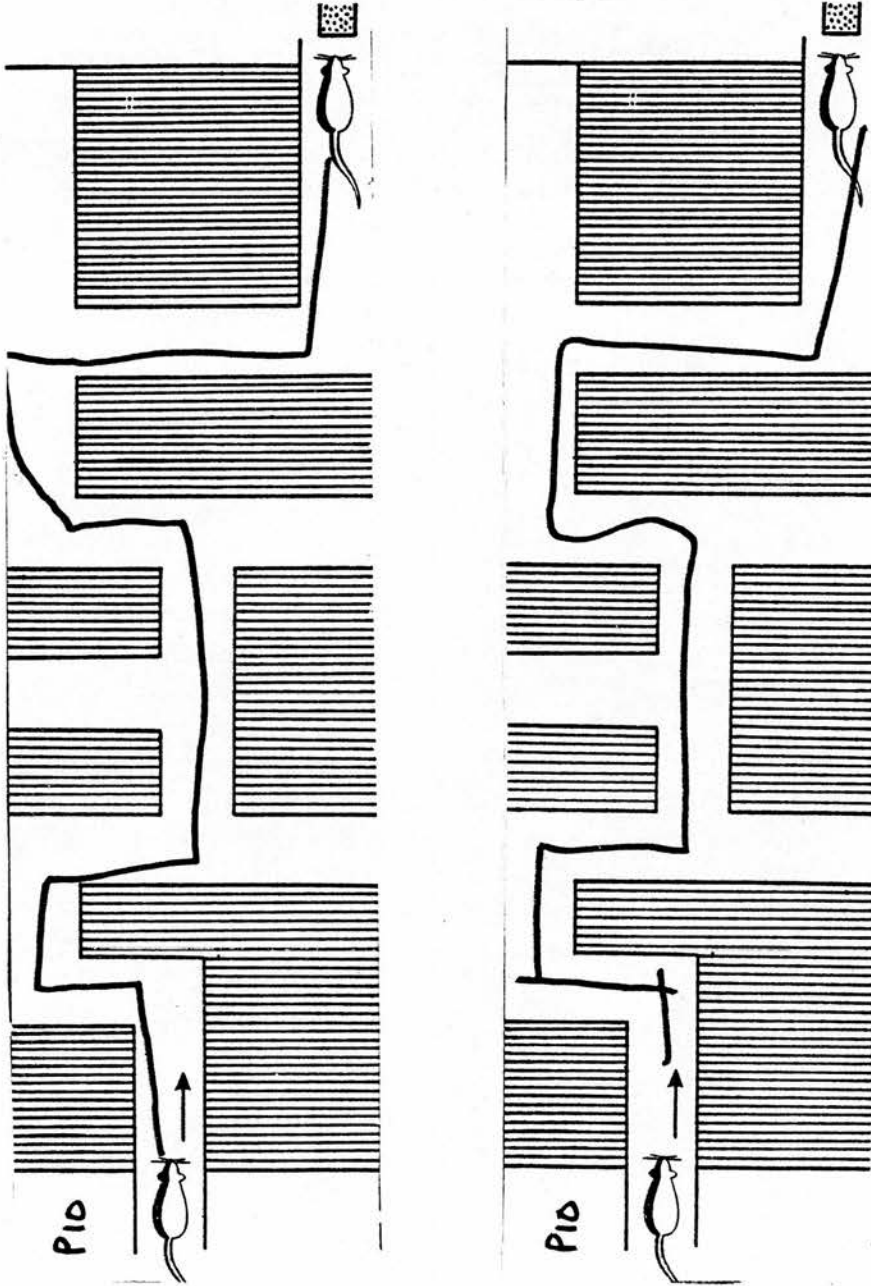
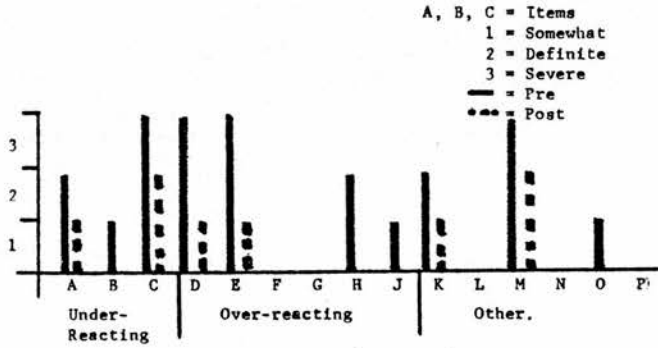


FIGURE 30 Pre- and Post-test Tracks for Subject P10

P.11

JASON (Mixed) Aged 5 years 4 months



Jason was very much the liveliest of this group and one who presented something of a problem to the class teacher. She reported that for the first month at school Jason had cried a lot, that he had shied away from work and had only in the recent past shown any response to encouragement. He still required some coaxing (Category A) and frequently would react against anything novel in the learning situation by preferring to follow his own ways (Category C). He never took time to think out what he was doing (Category D) preferring a non-reflective style. Jason lacked concentration and would be easily distracted by the slightest event (Category E). He would not remain at any task for any length of time and would display disinterest in activities after quite a brief spell (Category H). The teacher indicated that Category K described the difficulty she experienced in getting him to take any sustained interest in what was going on and that frequently he would refuse to work and stalk off angrily (Category M).

Jason was clearly quite a disciplinary handful and many aspects of his reported behaviour were evident to the investigator during his visits to the class. No evidence was available to the teacher or the investigator to suggest that either constitutional or domestic factors might have contributed to Jason's behaviour pattern. He was the youngest of three children, appeared fit and healthy with no obvious signs of any handicapping condition. To the class teacher, he remained a mystery - there were indications that he was capable but these were fleeting and short-lived. He was a "butterfly".

Throughout the first four sessions, the investigator found it difficult to hold and maintain Jason's concentration for any length of time. The 2 and 4-piece puzzles were thrown aside after only three or four attempts and then he would be off annoying other members of the group. The "Mail Boxes" initially proved to be difficult for Jason. He seemed not to recognise what was required and quickly became disinterested. By pairing him with Steven (P.12) some success was achieved on the "Merry-go-rounds". It was at this activity that Jason first demonstrated an ability to inhibit impulsive actions. It was decided that Jason and Steven should remain paired for a few sessions with the investigator closely monitoring what went on. If anything Steven benefitted more from such a pairing - this is reported in his case study.

At the sixth session, Jason was beginning to grasp the requirements of the "Mail Boxes" and he was seen to be carefully matching the card to be posted with the boxes in a way that was a marked improvement. Nevertheless, the gains attained over the remainder of

the sessions were minimal. At the 6 and 8-piece animal puzzles, Jason would show great difficulty in keeping to the sequential order and on occasions swept the cards to the floor in a temper. By the end of the experiment, Jason was only beginning to demonstrate partial inhibition of primitive action - impulsive behaviour. In the classroom situation, he was reported as showing slight improvements in his behaviour. He had not fully overcome his tendency to regress to ineffective behaviours despite demonstrating some competence in learning strategies. His test performances reflected this marginal improvement with the exception of the Columbia where Jason significantly increased his score and percentile ranking.

Columbia Mental Maturity Scale

Pre Test	Age Deviation Score	84	Percentile rank	16% tile
Post Test	Age Deviation Score	105	Percentile rank	62% tile

The significant feature to be reported is that Jason approached the post-test with marked confidence, interest and a successful strategy of careful checking before making a selection. This pattern was in marked contrast to his pre-test.

Porteus Maze Test

Pre Test	Test Age	4	Test Quotient	76
Post Test	Test Age	4½	Test Quotient	82

Pre Test	Maze Tracking Score	159
Post Test	Maze Tracking Score	115

Inspection of the relevant Year V tracks reveals a pre-test track of considerable immaturity. Noticeable is the tendency to follow the lines of the "walls" with the resultant entries into "blind alleys". This performance was completed only after several exhortations by the investigator. The post-test shows a markedly improved start which deteriorates in the last third of the Maze as Jason's interest began to flag. Despite a qualitatively better performance on the post-test track, Jason still produced a score well beyond the mean for the post-test tracks. (See Figure 31)

Discussion

Jason's post-experimental profile shows only slight improvement on Categories C and M with more noticeable improvement on Categories D and E. He has clearly not succeeded in acquiring a behavioural repertoire that is conducive to successful learning. Throughout the experimental sessions there were intermittent glimpses of his ability to control his impulsive sometimes undisciplined behaviour. These episodes were fleeting. In addition, his handling of the material similarly was characterised by spasmodic glimpses of planned, goal-oriented behaviour.

The question raised is : to what extent might other factors be militant against the child? Given that there were some improvements in behaviour reported it is worth speculating upon possible adverse factors that could be contributing to his continued difficulties. These factors lie in the area of cultural and family influences. In Jason's case no verifiable information was available to teacher or

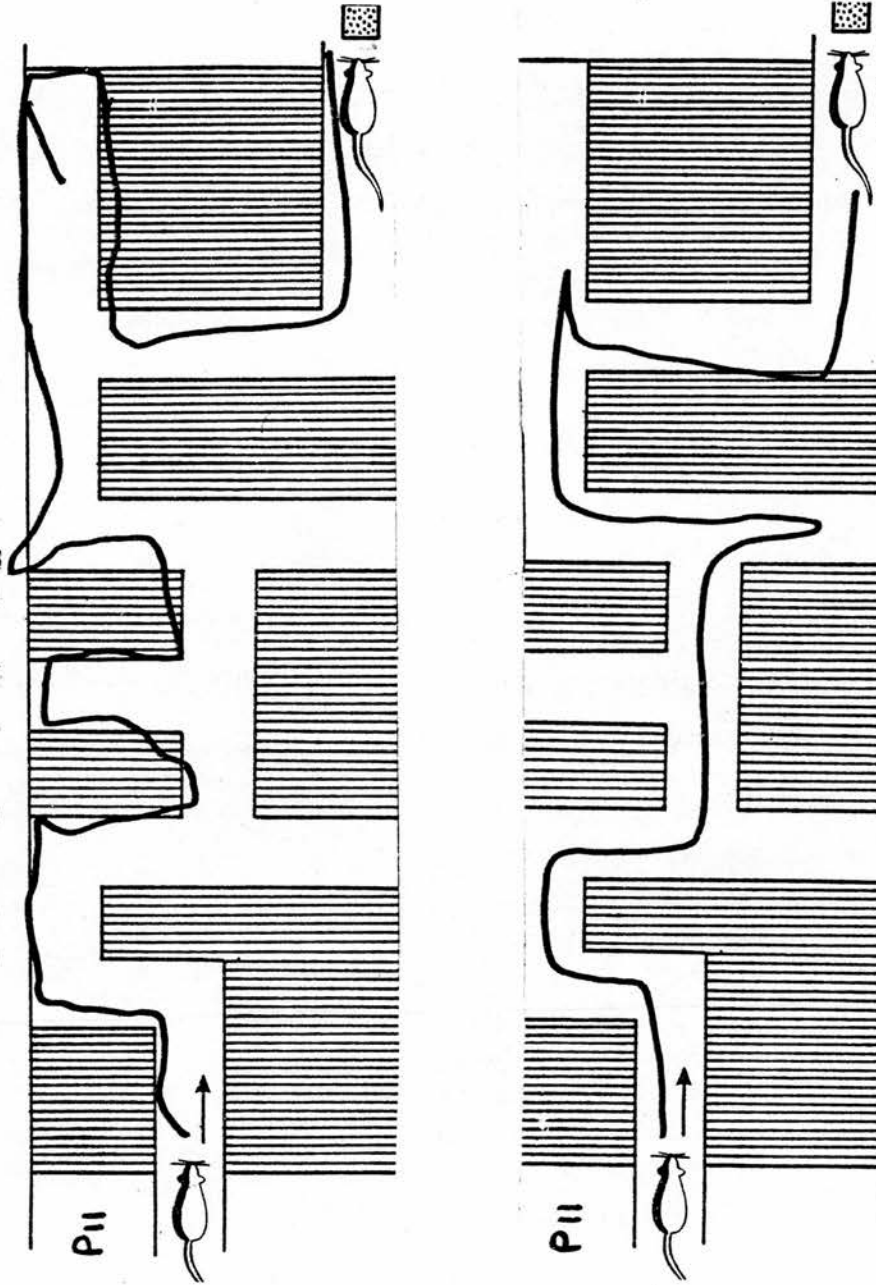
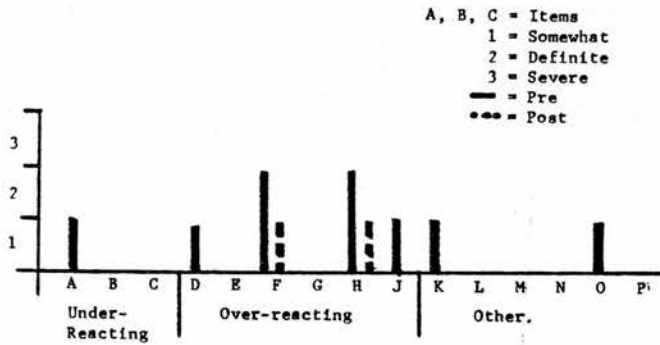


FIGURE 31 Pre- and Post-test Tracks for Subject P11

investigator to support such a view. Both were clearly of the opinion that Jason was capable of competent, masterful learning. The evidence of his Columbia score - even allowing for practice effects - suggested an able child. Nevertheless, the persistence of regressive behaviours suggested that factors external to the school situation were militating against Jason's successful coping. At this stage such factors could be only adumbrated.

P.12

STEVEN (Over-reacting) Aged 5 years 4 months



Steven was a freckle-faced lad with an infectious twinkle in his eyes. The teacher described him as being somewhat lazy as far as school work was concerned but in no way could he be described as lethargic generally. He was rather fidgety and prone to walking around the class for no purpose (Category F). The class teacher believed that this was part of a general repertoire of avoidance strategies since Steven was adept at finding ways and excuses for avoiding any classroom work (Category H). She described him as having "native wit" that enabled him to avoid being caught out and that she had always to keep a wary eye on him.

Steven was the only child in a single-parent family. He was well clothed and cared for, enjoyed good health and was not known to suffer from any ailments. His mother was known to be a very caring person, dependable and supportive of her child and had been known to confess to the teacher that perhaps she spoiled Steven by finding it

difficult to reprimand him or deny him his way. Elements of this "spoilt child" syndrome were apparent in the class.

On initial acquaintance, the investigator found Steven pleasant and responsive. He readily came with the writer to the activity corner and settled with the group. His conversation was always animated and displayed an active enquiring mind. This partly determined the decision to start him off with the "What's Happening?" puzzles to which he took readily. On completion of each he was more than willing to give a full verbal account of the event depicted.

On the collaborative activities he was less successful initially. The "Mail Boxes" seemed not to engage his interest for any time and he would seek to try another activity. It became apparent that the "Mail Boxes" were proving difficult for Steven and that he was demonstrating that strategy reported by his teacher, of finding a way to avoid the demands made on him by reverting to working at the (for him) easier 4-piece puzzles. This same avoidance behaviour was manifest at the "Merry-go-rounds" where he would fail to attend to the star/dot rule.

It was at this time that the decision to pair Jason (P.11) with him was made. As reported earlier, the benefits accrued to Steven. He remained paired with Jason for the remaining sessions and this proved for him to be a fortunate linking. Steven emerged as the dominant partner always reminding Jason of the "rules" of any game and at the same time displaying an increasingly controlled behaviour at all the activities presented. He protested at Jason's outbursts and would patiently try again any of the activities that he had swept off the table.

By the end of the experimental sessions, Steven was persisting at the most difficult tasks even when he was initially experiencing failure. This showed itself with the "Matchers" activity. Over two sessions he was continuously failing, despite his careful efforts at matching his card with the standard. He would express his frustration verbally but persisted until on a third session at the "Matchers" he saw what was required in considering all the possible similarities and differences. From this point he never looked back. He developed a more developed reflectivity; he tolerated initial failures and returned to the task to try again, of ten successfully.

In the testing situations, Steven demonstrated all round improvement on all the procedures.

Columbia Mental Maturity Scale

Pre Test	Age Deviation Score	89	Percentile rank	25% tile
Post Test	Age Deviation Score	106	Percentile rank	65% tile

In this test the post-experiment performance was markedly more controlled and confident. There were frequent eye movements indicating careful checking prior to choice.

Porteus Maze Test

Pre Test	Test Age	4½	Test Quotient	82
Post Test	Test Age	5½	Test Quotient	94
Pre Test	Maze Tracking Score	107		
Post Test	Maze Tracking Score	100		

The Year V tracks below show a more confident post-test performance which was executed with panache. Initially, Steven had been

very hesitant about the test and only after encouragement did he produce the pre-test track. (See Figure 32)

Discussion

Steven apparently found the closeness and structure of the small group of great benefit. Here he was able to concentrate on work which was meaningful and non-threatening. He gained in confidence quickly, revealing a capacity to pay attention and to co-operate. It is argued that he represents the kind of child who responds well to structure and in a classroom with a sensitive teacher aware of his needs he progressed well having demonstrated his competence over the experimental sessions. His avoidance behaviours gradually faded away and using this evidence the teacher explained to Steven's mother that she could contribute to his growing competence by not being so ready to let him have his way quite so readily. Such an happy relationship between school and parent operated to Steven's advantage.

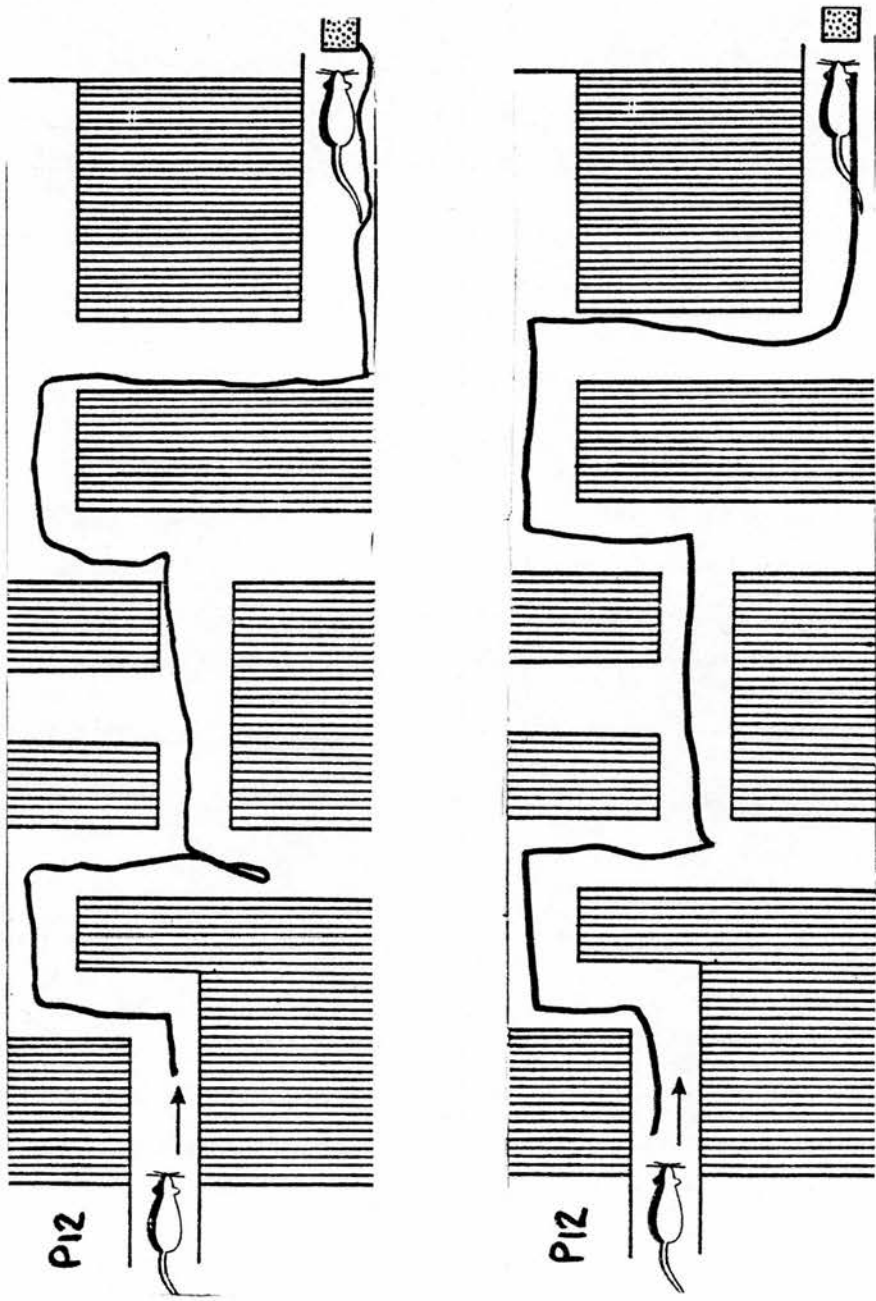
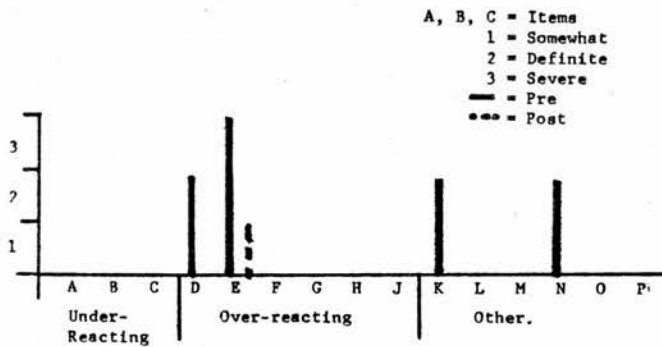


FIGURE 32 Pre- and Post-test Tracks for Subject P12

K.13

JAMES (Over-reacting) Aged 5 years 8 months



James was a pleasant child who seemed somehow to have limited powers of concentration (Category N). He created distractions for other children (Category E) and, taking no time to think for himself (Category K), guessed when required to answer questions (Category D). Throughout several visits to the classroom prior to the experiment the investigator had noticed that James smiled and giggled when spoken to but rarely returned any conversation. During the various pre-testing sessions he co-operated well, but did not speak. No abnormal features were known about James.

James joined the group quite readily and showed interest in the first two sessions. He tended to be somewhat solitary, taking little notice of the others in the group, who treated him in similar fashion. He tended not to finish any activity he was engaged upon and was quite unconcerned about this. He did, however, always make some attempt at the beginning of a task, the working being quite carefully done but no basic enjoyment was demonstrated. This general pattern of

behaviour remained constant over the experimental period. James was content to come along, work in his own way, intermittently causing some disturbance. He rarely volunteered to speak, but would answer when questioned. This experimenter became somewhat puzzled at this contrast in behaviour from that reported in the classroom and took the opportunity to observe James' classroom behaviour over a number of days where certainly the quality and repertoire of behaviours reported by the teacher were clearly in evidence.

Throughout the sessions James was happiest working by himself at the activities or with the experimenter. Whenever an activity became too taxing for him he would seek ways of avoiding continuation and only under those circumstances did he demonstrate the distracting behaviour commented upon. James tended to rely upon guesswork initially on the "Matchers" task but by the four session had grasped the nature of the task in terms of the need to consider all aspects of the cards and not just one dominant feature upon which he had focussed. At "Mail Boxes" he constantly made errors which were in effect created by the absence of any clear indication of orientation. When the cards were so marked by the investigator James' success ratio increased. His performance on "Merry-go-rounds" improved once he learned the convention of the star/dot rule and thereafter was errorless.

By the end of the sessions, the teacher was reporting that James was showing some improvements in the classroom, on that he was no longer inclined to make guessing responses or to bother others by distracting them. In short, he was more self-contained, more achievement motivated and better able to concentrate on the tasks at hand.

These improvements appeared to be more dramatic in the general teaching context than in the experimental sessions where James did not display to quite the same extent the unproductive behaviours described earlier.

In terms of the testing sessions James demonstrated gains reported below.

Columbia Mental Maturity Scale

Pre Test	Age Deviation Score	86	Percentile rank 19% tile
Post Test	Age Deviation Score	98	Percentile rank 45% tile

Throughout the pre-test, James gave up his initial attempts to work out the answers and reverted to pointing at the selections on the card in a random manner.

Porteus Maze Test

Pre Test	Test Age	4	Test Quotient	74
Post Test	Test Age	5½	Test Quotient	92
Pre Test	Maze Tracking Score		146	
Post Test	Maze Tracking Score		88	

Of all the subjects, James presented the most dramatic improvement on the Maze Tracking Score as inspection of the Year V tracks will verify. His pre-test degenerated into a random uncontrolled effort typical of his tendency to give up. The post-test is marked for its confidence and ease of execution. (See Figure 33)

Discussion

As has been indicated in the foregoing study, James represented something of a puzzle. In discussing James with the teacher after the

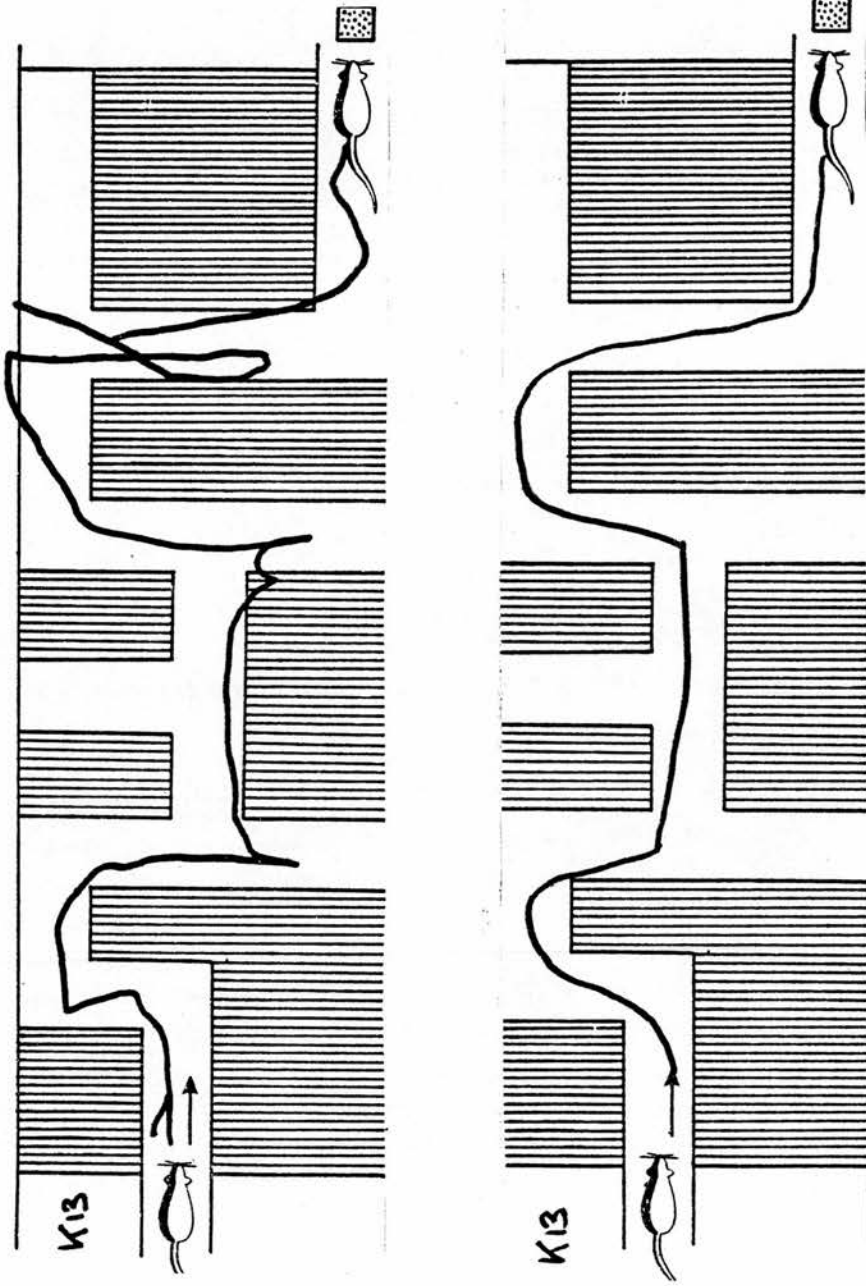


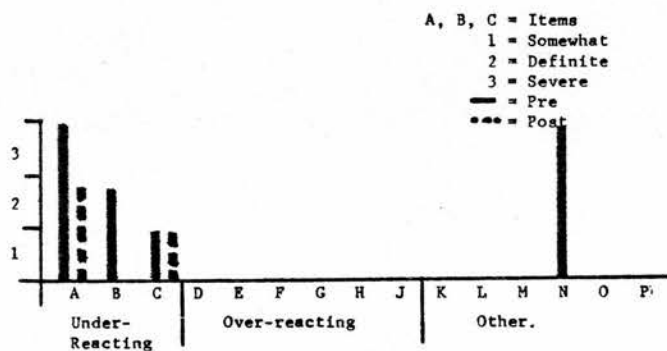
FIGURE 33 Pre- and Post-test Tracks for Subject K13

experiment, it was agreed that this child had not been understood, even under careful observation in the two situations. The teacher was left wondering about the direction she might take with him in order to help him progress.

It was evident that the small group situation had permitted James to settle down to some individual, carefully guided work but had not spurred him to show any initiative in developing his learning strategies. It was suggested that in the open classroom setting James was somewhat "at sea" and that within the framework of a structured, small group he would successfully acquire those behaviours conducive to classroom success.

K.14

HELEN (Under-reacting) Aged 5 years 6 months



Helen was extremely shy. She would "freeze" when approached (Category A) and would barely answer her teacher in a whisper. She was withdrawn to the point that one might assume her to be dull (Category B). She seemed a solitary child and did not mix with her classmates (Category C). In terms of classroom activities she would only pay attention to materials or activities for the briefest of moments (Category N). Sometimes she would be found sitting unable or unwilling to initiate any activity.

It was obvious to the teacher, from the infrequent work produced by Helen, that potentially, the child was competent, but that her withdrawn behaviour was affecting her development as an efficient learner. During the pre-experimental visits, Helen did not speak to the investigator though she did smile diffidently to him, then blushed and averted her gaze. In the testing sessions the investigator found her so apprehensive that it was difficult for her to function. After

much encouragement she did make an effort to co-operate on all the tests although without uttering a word. She was a late child of middle aged parents who already had a grown-up family. They were concerned at Helen's shyness but could shed no light on possible causes.

On the experimental sessions it was always a major effort to get Helen to join the group. She would never cry but would sit at her classroom table smiling shyly and slowly shaking her head in refusal. Usually she would come but unless she were immediately faced with some activity she would sit and look not initiating anything nor communicating with other members of the group. She completed the 2 and 4-piece puzzles correctly but would never respond to the question, "What have you made?" Whilst paired with Colin (K.16) at the "Mail Boxes" she would not take on the role of "receiver" preferring to post rather than check since that required verbal communication. Her "posting" strategy was effective, she would work very slowly holding each card against the box, checking and double checking before committing herself. Colin was always irritated by her painstaking slowness.

At the "Matchers" activity she was very timid, initially failing and then making to give up. The investigator persevered with her and after encouragement and a sense of success she tentatively continued with the activity. This was very much the pattern of Helen's behaviour at all the tasks, she would seem to be refusing, would respond to encouragement and continue to seek it or look at the investigator, irrespective of whom he was with, to get him to come and confirm her success. Her whole manner was one of timidity, an unforth-

comingness that clearly placed Helen in that category of child whose learning problems are ascribed by Stott (1969) to a deficit in effectiveness motivation. Neither the experimenter nor the class teacher were able to get Helen to explain the "What's Happening?" activity even although she had successfully completed.

In class, the teacher reported that Helen was still as withdrawn as ever but that she had begun ever so tentatively to be drawn into activities and was beginning to demonstrate competencies that had not been evident before. She was working on her own at number activities; was responding monosyllabically to questions and would be heard at her reading. Despite these improvements, which the teacher described as marginal, Helen seemed not to initiate anything and unless pushed, would appear to be satisfied with only minimal effort.

On test performances Helen displayed marginal improvements.

Columbia Mental Maturity Scale

Pre Test	Age Deviation Score	91	Percentile rank	29% tile
Post Test	Age Deviation Score	108	Percentile rank	69% tile

During the pre-test, it was difficult to get Helen to participate. She would sit and look at the cards, smile diffidently and only after a long pause would she make a tentative attempt. On post-test performance, she was somewhat more confident. The constant refusals that had so characterised her pre-test performance only emerged when she approached her ceiling on the test.

Porteus Maze Test

Pre Test	Test Age	5	Test Quotient	88
Post Test	Test Age	5½	Test Quotient	92

Pre Test	Maze Tracking Score	123 (includes penalty)
Post Test	Maze Tracking Score	92

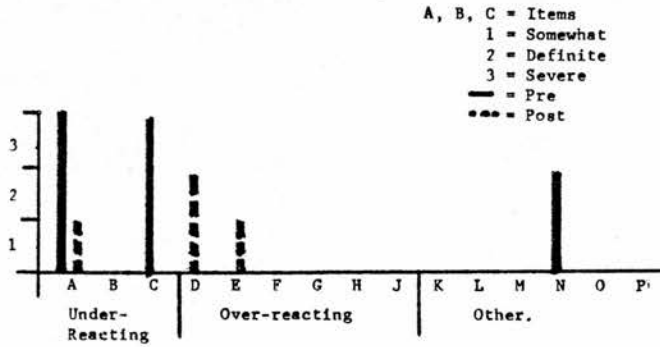
Inspection of the relevant Year V tracks shows a pre-test track that begins tentatively, proceeds correctly enough and in the last third cuts across "the wall" thereby incurring the penalty described in Chapter 6. The post-test track is an effective and competent completion. (See Figure 34)

Discussion

Inclusion in a small group, and the availability of instant encouragement for small gains on simple but meaningful tasks, seemed to produce only marginal improvements in Helen's withdrawn state. They fell far short of success in motivating her to achieve her full potential although on post-test performance there was evidence to refute the earlier belief that Helen might be a dull child. With this child her low level of effectiveness motivation was such that anything novel or demanding was a threat to her modest levels of competence. That Helen did make marginal gains both in achievement and behavioural style is held as supporting the view that an effective learning style did exist but that more prolonged and intensive support would be required to enable Helen to cope with learning tasks in a masterful manner.

K.15

KEVIN (Under-reacting) Aged 6 years 2 months



The teacher's description of Kevin was that he behaved in an extremely withdrawn manner (Category A) and that it was difficult to know whether she was understood when she spoke to the child or tried to instruct him (Category N). This partially explained her view that Kevin seemed to exist in a world all of his own and never seemed to listen (Category C). She further commented that his work in class was negligible, that he would sit and fiddle with his work but would seldom make any attempt to complete it. His attempts were unvariably messy and would often end up on the floor.

Kevin studiously avoided the experimenter when he visited the classroom. When approached he visibly shrank and looked away. In the testing situation, he was nervous, but once settled, he took to the various tasks, showing some enthusiasm for the Columbia. Beyond being the elder of two boys in a family known to be caring and interested in the school, no other information was known about him.

On the start of the experimental sessions, Kevin was reluctant to join the group but on seeing that his friend James (K.13) was a member he readily joined in and paired up with him for a number of activities throughout the eight sessions. Initially Kevin showed some timidity at working with the 4-piece puzzles and seemed hopelessly confused at the "Mail Boxes" where upon he gave up. For the first two sessions he tended to be withdrawn but by the third session was noticeably less so. At the "Merry-go-rounds" he tended to be somewhat impetuous and not at all careful at attending to the rule.

Instead of maintaining a sober, frightened appearance, he began to smile, to laugh and to verbalise. As he became more outgoing in the small group, so too was it noticed in the classroom where the teacher commented that, "he was really coming out of his shell". In terms of learning strategies, Kevin's earlier withdrawnness was being replaced by a tendency to be somewhat impetuous. At the "Matchers" activity he would not take long enough to consider all the possible differences so that failure ensued. This obviously bothered Kevin as he sought out the investigator to complain that, "the game is wrong". On showing him the "key" to the activity he spent the remainder of the session with his friend James. His strategy was noticeable for its controlled approach which produced both success and obvious delight.

By the end of the experimental sessions, Kevin was coping very well. His earlier withdrawnness had become replaced with a liveliness and willingness to initiate that was in marked contrast. The class teacher also noted that he was much more willing to make an effort in class and that if anything his behavioural style had changed dramatically from under-to over-reacting.

On re-testing Kevin made very few gains on his earlier scores with the exception of the Columbia.

Columbia Mental Maturity Scale

Pre Test	Age Deviation Score	90	Percentile rank	27% tile
Post Test	Age Deviation Score	106	Percentile rank	65% tile

The noticeable features of his performance were; a greater tendency to check each card on post-test, an increased confidence on post-test compared with the "freezing" on pre-test and an accompanying verbal commentary on post-test.

Porteus Maze Test

Pre Test	Test Age	4	Test Quotient	72
Post Test	Test Age	4½	Test Quotient	78
Pre Test	Maze Tracking Score	113		
Post Test	Maze Tracking Score	107		

Inspection of the Year V tracks shows no real gains made over time. Both tracks repeat characteristic errors affecting the tracking score and which by Porteus (1965) criteria continue to show immaturity. (See Figure 35)

Discussion

The interesting feature of Kevin is that he should so readily shed his withdrawn behaviour and emerge after the experimental sessions presenting a degree of over-reacting behaviour. As the class teacher indicated, Kevin did "come out of his shell". The security of the small group, the individual attention, the experiencing of success

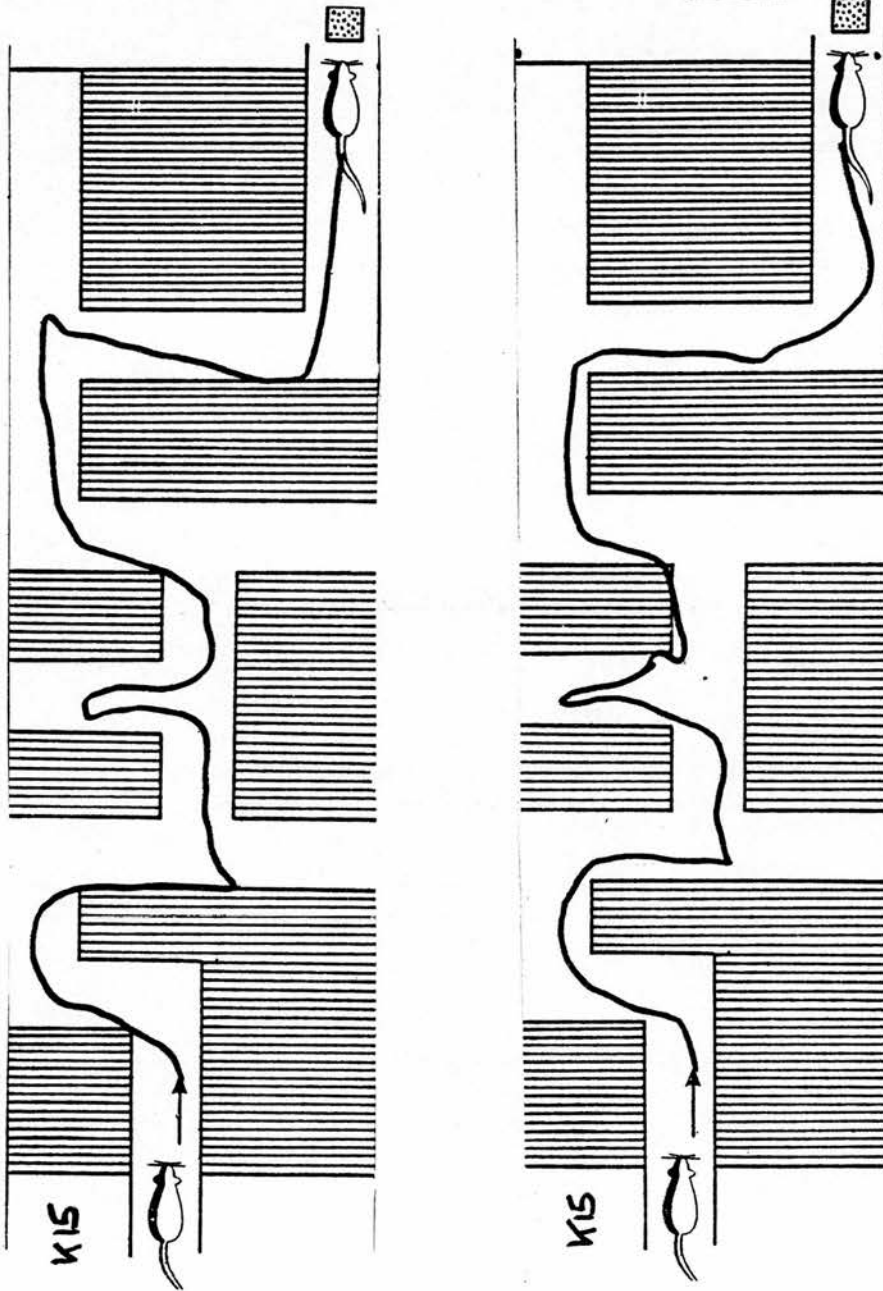


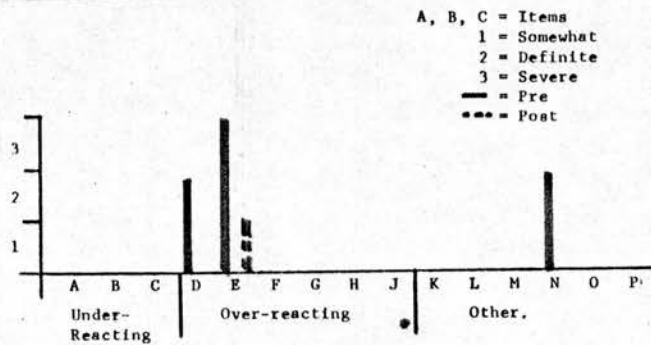
FIGURE 35 Pre- and Post-test Tracks for Subject K15

all combined to give him that confidence with which to proceed.

Further, the influence of working collaboratively with James (K.13) was seen to be beneficial for Kevin.

K.16

COLIN (Over-reacting) Aged 5 years 4 months



Colin was in many ways a somewhat pathetic child. He had a very marked speech impairment which made it difficult to understand him. When he became excited this impediment was more pronounced and his intelligibility was greatly decreased. He was the elder of two children who lived in the country some miles from the school. His father was a shepherd and Colin loved nothing better than to speak of his sheep-dog. He was quite an active child and was described by his teacher as appearing to be rather dull. He would revert a lot to guesswork (Category D) in his class and would be easily distracted from work by the slightest novelty (Category E); this combined with his lack of concentration (Category N) placed Colin firmly in the "over-reacting" class of pupil although he did not present as a problem of discipline.

Colin was a very friendly child and took easily to the small group situation. He clearly relished the special attention of the investigator and in his entering the class for each of the sessions.

Colin was seen to be half out of his classroom seat ready to race to the activity corner. Throughout the initial sessions, Colin tended to rush about trying all the activities but never completing one. There was nothing reflective about his style and frequently others in the group complained to and about Colin.

By the third session, Colin was able to persevere at an activity to completion. On the "Mail Boxes" he gradually developed a strategy of holding the card up to the box to match against the letters all the time chattering away at what he was doing then posting his card at the same time looking over the top to see if he was right. With Colin and to a greater extent David (K.17) it was necessary to cover the top of the Mail Boxes to prevent this happening. Much of Colin's earlier attempts were characterised by impulsive type behaviour and on the rare occasions when such trial and error activity paid off, he was delighted at his success.

During the fourth week whilst working at the "Merry-go-rounds", Colin had noticeably begun to inhibit his impulsive behaviour and adapt a more reflective approach. Whilst working at the "Matchers" activity he was overheard to be checking, "Now that has two windows" and so on. Such an approach took time but paid off and gave Colin great delight. Whilst he took time he was less than patient with any partner who similarly took a long time. He constantly scolded Helen (K.14) for her slowness at posting in the "Mail Boxes game. Thus he had still much to learn in collaborative activities. Certainly on those activities where he played the dominant role he was happiest.

Towards the end of the experimental sessions Colin had clearly learned to inhibit impulsive actions and to rely less on guess work.

In class, his teacher commented upon his improvement and that he was now "taking time to learn". There was much concern about his speech impairment and it was recommended that the advice and help of speech therapists be sought.

On testing Colin demonstrated improvements particularly in the Maze Tracking Test.

Columbia Mental Maturity Scale

Pre Test	Age Deviation Scale	88	Percentile rank	23% tile
Post Test	Age Deviation Scale	92	Percentile rank	31% tile

This test produced the least gain. Both pre and post-test performances were marked by considerable guessing with little time being spent on checking. Colin was quite happy to look and point and ask for the next card.

Porteus Maze Test

Pre Test	Test Age	4	Test Quotient	76
Post Test	Test Age	5	Test Quotient	88

Pre Test	Maze Tracking Score	125
Post Test	Maze Tracking Score	91

The Year V tracks show a pre-test track of some immaturity - this is contrasted with a smooth, successful post-test track which Colin completed quickly and confidently. (See Figure 36)

Discussion

From the comparison of the profiles on the Guide to the Child's Learning Behaviour and from the foregoing report, the experimental

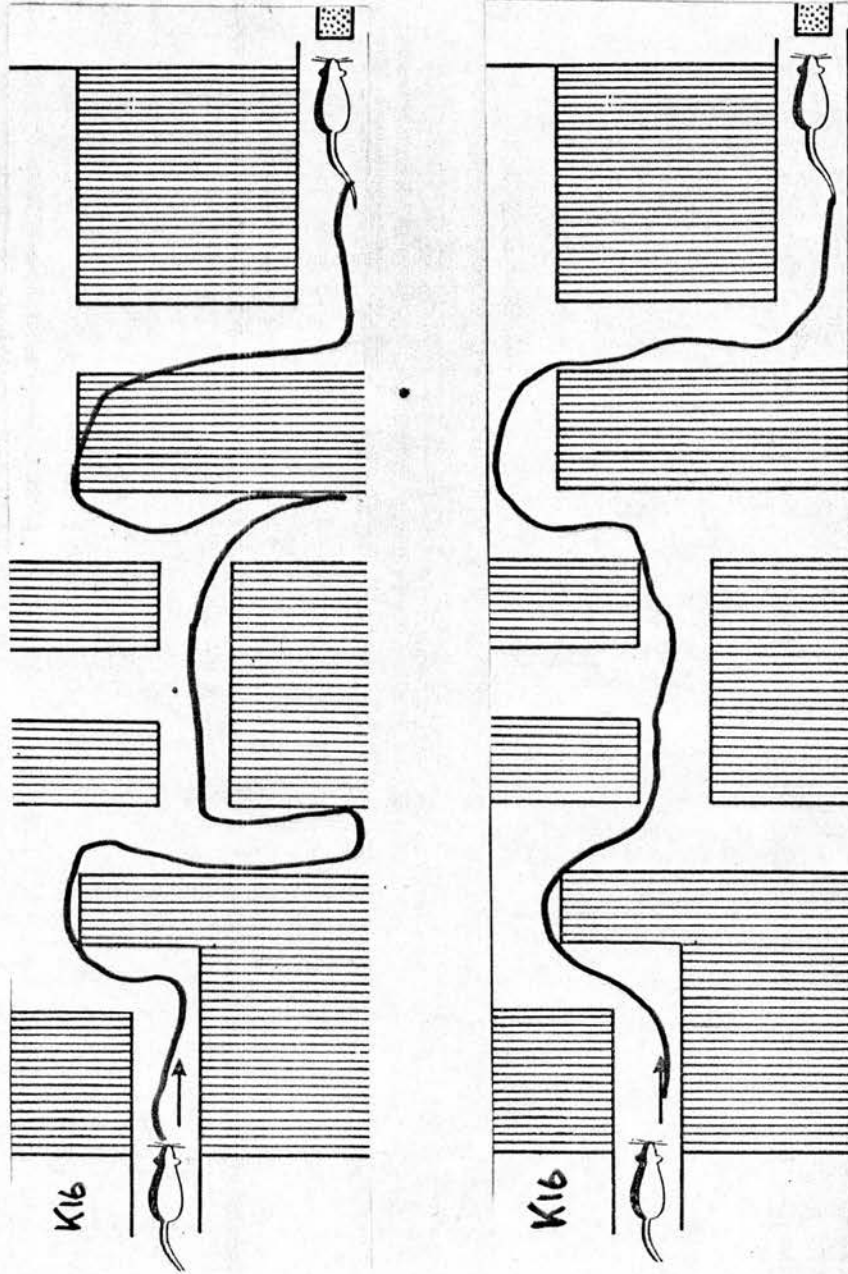
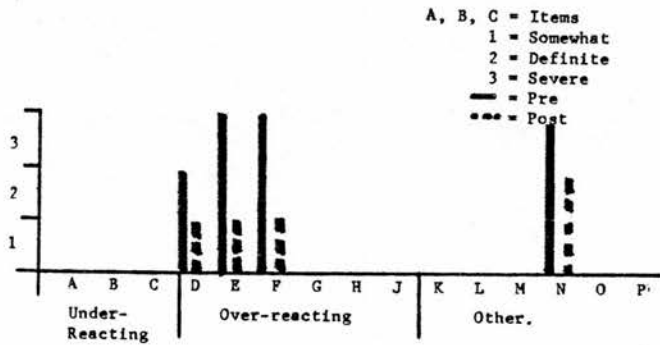


FIGURE 36 Pre- and Post-test Tracks for Subject K16

programme met some of Colin's needs so that he was able to learn to attend and to enjoy the follow-through that goes with evoked interest. The class teacher was more satisfied with his general approach to learning situations and felt that the attention he had received had been beneficial. It was also felt that the proposed sessions with the speech therapist would also support Colin in gaining self-confidence.

K.17

DAVID (Over-reacting) Aged 6 years 2 months



Of all the children in the study, David was by far the most difficult to work with. His classroom behaviour was characterised by an hyperactivity of a degree that disturbed even this most active of classrooms. In class work he frequently resorted to guesswork (Category D), he was easily distracted (Category E), would fidget and often run about the room (Category F) and never seemed to concentrate even for a minute (Category N) appearing incapable of keeping his attention on one thing for any length of time. His level of achievement in the classroom was described as "low" and this was borne out by an examination of his written and oral work. Nothing in his history offered any explanation for this degree of hyperactivity.

Throughout the experimental sessions David presented something of a management problem. Initially he would only stay for a few minutes but gradually, as he became interested in the activities, he began to demonstrate greater control, a degree of planning and a less

erratic behaviour in contrast to that on first acquaintance. He began to collaborate on activities such as "Mail Boxes" and "Merry-go rounds" and slowly began to inhibit the more impulsive behaviour that was his preferred style for so long. Though he was showing a development of productive learning strategies, his approach still needed a more developed form of reflectivity. In the class, the teacher noted that whilst David was showing marked improvement in his ability to inhibit his impulsivity he still had a tendency to regress to the ineffective behaviours that prevented him from utilising his skills.

David's performances on the various tests showed similar improvement.

Columbia Mental Maturity Scale

Pre Test	Age Deviation Scale	85	Percentile rank	17% tile
Post Test	Age Deviation Scale	91	Percentile rank	29% tile

This reflects a modest improvement, but what is striking is that during the post-test, David spent more time scanning the cards, guessed less and was observed to be checking and re-checking the cards before electing his choice.

Porteus Maze Test

Pre Test	Test Age	4	Test Quotient	72
Post Test	Test Age	5	Test Quotient	84

Pre Test	Maze Tracking Score	146
Post Test	Maze Tracking Score	93

Inspection of the Year V tracks reveals a pre-test track that is highly disorganised compared with the more controlled and successful attempt of the post-test. Indeed, throughout the pre-test David spent much of the time constantly looking up and around whilst doing it at the same time. (See Figure 37)

Discussion

No claim is made that David's over-reacting behaviour disappeared. Indeed, he continued to plague the teacher and the class with his lapses. What was noticeable however was that such episodes became less frequent and what time he did spend at classroom activities was spent productively in a way that had not been the case previously. Resulting from the reported improvement in behaviour and the gains in test performance reported above, it is suggested that in a controlled, structured setting David was capable of "learning how to learn" and that his inappropriate learning style had been due more to general cultural influences than to any functional disorder.

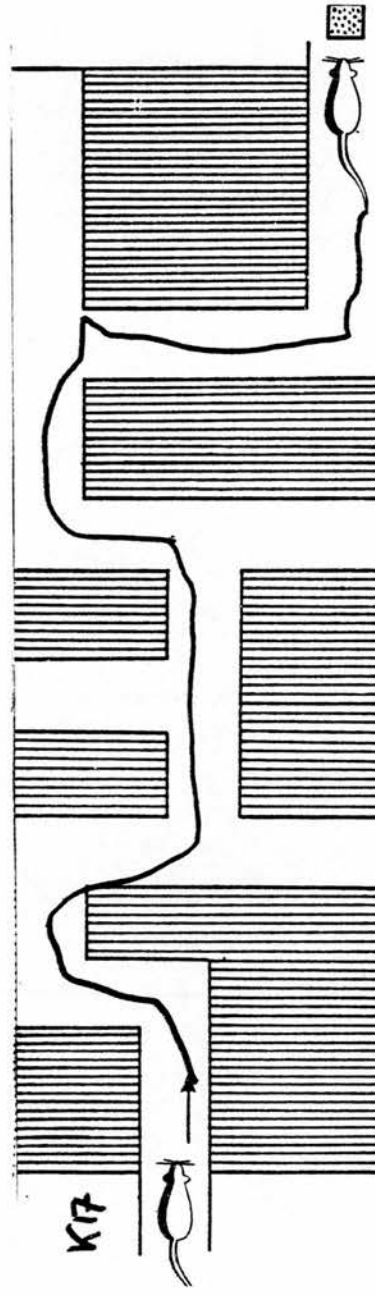
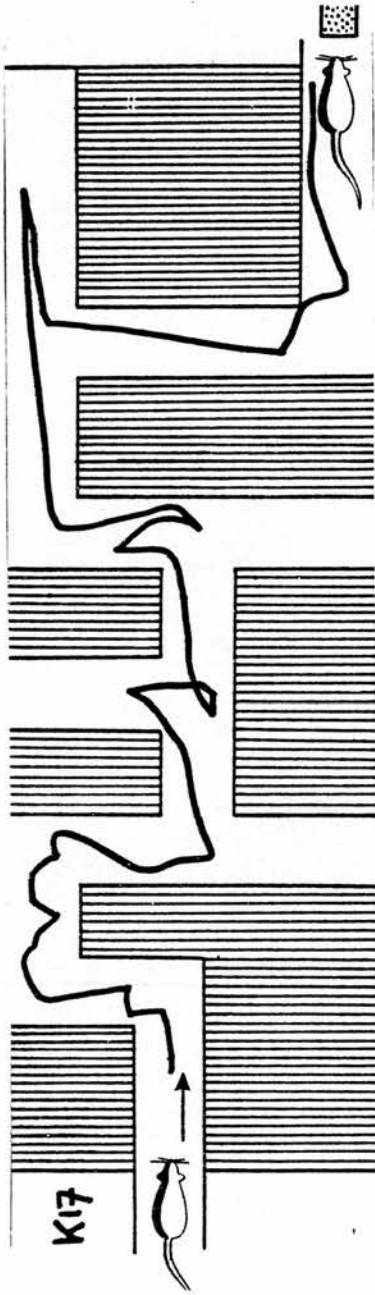


FIGURE 37

Pre- and Post-test Tracks for Subject K17

CONCLUSION

The study of the improvement of learning strategies by case reports is a useful method of viewing the effects on the children of the Flying Start programme, as observed by the investigator and the extent to which the effects are transferred to the classroom situation. These two results are not necessarily congruent, the latter being dependent upon the particular total classroom environment in which the child must operate.

The information contained in the case studies is summarised in Table 9 . This incorporates the two six-point rating scales devised by the investigator, and described at the beginning of this Chapter - the scales themselves being reproduced in Appendix F . Inspection of Table 9 Columns 6 and 7 reveals that investigator and teachers were in close agreement over their respective ratings of the children.

In this study, children were drawn from four separate schools in different localities of a local education authority district. All four schools operated upon open-plan principles. The case studies describe in brief detail the observations of teachers and investigator. Three children B.5, P.11, and K.14, showed "poor" progress in response to the Flying Start materials. None of the children regressed in behaviour although one, K.15 began to present over-reacting behaviours after the sessions, having been initially described as "under-reacting". In only one case, B.8 did the investigator and teacher markedly differ on their ratings. This reflected the failure of the child to transfer to the classroom teaching situation the learning styles that he had come to demonstrate in the small group.

Child	Behaviour Disturbance	Health/ Developmental Handicap	Neuro-Signs	Cultural Deprivation	Investigator's Assessment of Pupils' Responses			Investigator's Rating of Improvement	Teacher's Verbal Reports on Adaptation	Freedom from Signs of Faulty Learning Behaviours as Shown by Guide		
					Rapid	Slow	Poor			Clear	Sign	Little
R 1	Mixed		*	*		*		3	3		*	
R 2	Mixed				*			3	4	*		
R 3	Over-reacting					*		4	3		*	
R 4	Under-reacting	*				*		4	4		*	
B 5	Over-reacting						*	1	2			*
B 6	Over-reacting				*			5	5	*		
B 7	Under-reacting	*				*		4	4	*		
B 8	Over-reacting					*		2	4		*	
P 9	Over-reacting			*		*		4	4		*	
P10	Over-reacting	*			*			4	4		*	
P11	Mixed						*	2	2			*
P12	Over-reacting					*		4	4		*	
K13	Over-reacting					*		3	4		*	
K14	Under-reacting						*	1	1			*
K15	Under-reacting					*		4	4		*	
K16	Over-reacting	*				*		4	4		*	
K17	Over-reacting					*		4	3		*	

TABLE 9 Behavioural data for Experimental Group (n=17)

The case studies serve as a useful source of qualitative information concerning the children. Such reports serve to underline and complement the statistical analysis reported elsewhere and are in no way presented as a substitute.

CHAPTER 8

DISCUSSION

The purpose of the study was to evaluate a method of improving learning strategies in primary school children at the Primary 1 and 2 level, considered to be at risk for learning failure. Teacher observations of a child's consistent use of ineffective behaviours in the learning situation were used to define the population for study.

Since the criteria for change were behavioural, it was important to go beyond the simple presentation of standardized test results by adding measures intended to show change in task strategy. In addition, a number of case study reports illustrate, by example, the nature and rate of observable changes in the learning behaviour of some of the subjects.

The Guide

The evidence presented strongly suggests that the Guide to the Child's Behaviour in the Learning Situation, despite qualifications, was useful in detecting changes in children's behaviours. Support for the use of structured instruments such as the Guide comes from Lesiak (1973) who reported that teachers in his study needed guidelines to identify young children at risk. Rutter (1967) also reports the need for reliable and valid questionnaires which concerned behaviour occurring in a school situation and which could be used to discriminate between different types of behaviour disorder.

The Flying Start

In this study children who had been involved in the Flying Start programme showed significantly improved learning behaviour profiles than those in the Control Group. It would appear therefore that learning strategies fostered by the Flying Start proved to be useful in allowing better interaction in the classroom environments, whereas those children following the Control group activities did not appear to demonstrate as effective strategies at this age level.

None of the seventeen Flying Start subjects showed a worsening of learning behaviour, and all but three had greatly improved.

Over-reactive and Under-reactive

An important part of the evaluative process in this study is the question of the differential experimental effects on the different kinds of children, i.e., the over-reactive and the under-reactive. Only one of the clearly over-reacting children (B5) failed to show marked improvement over time although her behaviour profile did show a decrease. The remainder of the over-reacting group all showed substantial improvement which, given the nature of the data and the numbers involved can only be commented upon qualitatively rather than statistically. These findings support the contention that impulsive, over-reactive children at a certain level of maturity can overcome the difficulties which they commonly exhibit in problem-solving situations by paying attention to methods of planning strategy. Egeland (1974) also reports such a finding in a study of impulsive children. Stott (1978) reports a number of studies which similarly echo this finding.

In an experiment which emphasized the teaching of scanning strategies to impulsive children, Ault (1973) remarked that the 'impulsive' performance has been previously interpreted solely in terms of "tempo", whereas the problem-solving strategy adopted now appeared to be a more likely contributor to failure for these children. It is likely that conceptual style, tempo and attention are all involved as the components of scanning and choosing strategies when children undertake tasks such as those involved in the Flying Start.

The effects of a problem-solving programme on the Flying Start group certainly seems to bear out these suggestions. These children were more capable of attending to relevant details, of withholding impulsive error-making responses, and of generalizing this effect to the classroom situation than were the Control group. For example, Richard (B6) and Colin (K16) both showed dramatic improvements in their application of strategies to class work. Further, some of the over-reactive Flying Start subjects responded to the non-pressured testing situations to achieve greater gains than those in the under-reactive group on the Porteus Maze Test which was used in this study to measure task approach.

Under-reactive children

Within the Flying Start experimental group (n=17) there were four children who clearly presented under-reactive profiles on the Guide. These four children appeared to improve as much as their over-reactive counterparts with Duncan (R4) being the one child who demonstrated the most dramatic "improvement". Despite the small

numbers under consideration here, the gains made by these children previously classified "under-reactive" may be considered as important and merit further investigation. A child whose behaviour is withdrawn cannot reveal his potential, so that any facility he may have in problem-solving may go unnoticed. There is the chance that he may be considered as "having problems" if the teacher assumes that poor work habits may be interpreted as poor ability. One example from this study might have been Duncan (R4), who spent a considerable portion of his school hours actually hiding from the teacher and other children. This could not have been a game he was playing, since he was so often miserable. The teacher was finding it difficult to estimate Duncan's potential. In the Flying Start sessions, Duncan found that he was able to perform on tasks requiring attention to detail, sequencing and decision making. Armed with a new confidence, his demeanour in the class was noticeably different. He became capable of responding and co-operating which inevitably resulted in higher bids for achievement, a more positive interpersonal interaction with peers and teacher, and diminished anxiety.

Implications of the Use of the Tests Designed to Measure Change in Task Strategy

An attempt was made to utilize the testing situation so that children could be studied according to their approach to problem solving. Theoretically, changes in these approaches could then be recorded. Of the tests used for this purpose, the Porteus Maze Test may most repay further investigation, provided that one accepts the underlying assumption that the manner of a problem solving approach

can be reflected in maze tracking of this kind. In this study the Flying Start Group showed improvement in this test although the technique used to determine this must be admitted as being simplistic and open to further scrutiny. The need clearly exists to develop or to adopt existing tests so as to measure reasoned and reflective approaches to problem solving activities. The Columbia Mental Maturity Scale offers such a possibility but crucial observations of test performance were not amenable to qualification, e.g. eye movements; moreover the only response by the child to be scored was a pointing one from which inferences were made "that the child had reasoned out" his answer - the child might have guessed correctly. Nevertheless, the Flying Start Group significantly improved their performance on this test thereby giving tentative support to the view that the Flying Start programme trained children effectively in such behaviours as attending to relevant details, of withholding impulsive error-making responses etc.

Improvement in Learning Style

What could be described as a "frame-by-frame analysis of the performance" of the subjects involved in this study is possible from the case study reports, and is offered in this study as an important part of the evaluative process. Some children showed remarkable changes in behaviour, obvious to both the investigator and the classroom teacher, following the third half-hour session. Teachers noted such changes at this stage for Carol (R2), Evelyn (B7) and Lindsay (P10). Stott (1974) would attribute such effects to different reasons for the poor learning behaviour, the expectation being that children who were able to achieve rapid adjustment were, in the first

place, suffering a less severe handicap than these whose recovery was slower. For example, James (K13) showed evidence of some regression and Helen (K14) demonstrated very little improvement. In their respective cases, it could be argued that their handicaps were much more deeply rooted and perhaps might lie in some pathology. Thus, the need is demonstrated in such research to have verifiable life histories. Unfortunately, life histories were not available on the subjects in this study to test this hypothesis, although in five cases relevant information was known. Such facts as were known were summarised in Table 9 and readers are invited to refer back to it at this point. In any future investigation of this type it would be of great benefit to obtain detailed life histories of all subjects.

Referring again to James (K13) and Helen (K14) whose improvement over time was marginal, it is relevant to comment upon the remark made by their class teacher that she felt they found the "open-plan" environment enough of a threat to their level of functioning as to be a factor in their failure to learn how to learn. Anecdotal evidence from teachers in open-plan schools suggests that such environments might indeed be counter-productive to the acquisition of appropriate learning strategies in children. This may have been the case in respect of James and Helen but could not be tested out under the design of the study. All four schools involved in this study were built on "open-plan" principles with school K being the most avant-garde of this genre. It certainly merits investigation, namely, the extent to which the structural configuration of the school and its "classrooms" contributes to the acquisition of learning strategies in children and such an avenue of investigation is clearly indicated.

Comments on the Evaluation

As has been pointed out earlier, the "Flying Start" is both a method and a programme. These structured materials allow children at risk to bring into play little-used abilities which permit the development of good learning strategies. The programme moreover has sufficient flexibility to accommodate a reasonably wide range of individual differences. This accords with Guralnick's (1973) view that effective instructional materials, designed even for a restricted population, should have sufficient flexibility built into the materials to accommodate a reasonably wide range of individual differences. Under favourable conditions, these modes of attack in problem solving generalize to the classroom situation. As a result classroom behaviour is seen to be more purposeful, orderly, mature, and consequently more acceptable.

In this study the experimenter was both conducting a formative evaluation of the Flying Start programme and attempting to encourage significant changes in the subjects. Problems discovered in administering the Flying Start programme with any particular set of children had to be remedied on the spot or the new way of dealing with the materials would be put into action at the next session with different children. As indicated earlier, most of the variations on playing the games had been initiated in the pilot study, but the variability of response between children of four and five years of age further complicated the process. At an impressionistic level the changes made in the course of the evaluation appear to have favoured the older children.

Another feature of variability of response affecting the evaluative process concerns the composition of the small groups. These groups contained mixtures of under- and over-reactive children, bringing with them inappropriate response sets to the learning situation. Adaptation to the experimental situation was extremely difficult for a few of these children. In fact children such as Duncan (R4) were not sufficiently flexible to adjust to work with the other children in their groups. These children were able to improve their learning strategies with the support of the experimenter on a one-to-one basis, thus making a beginning towards the establishment of a co-operative approach to the learning situation.

The occurrence of children in the Flying Start group whose development of adequate responses to treatment was "slow" may be related to another feature of the experimental design. Two half-hour sessions per week for eight weeks under the above conditions may be insufficient for slow responders. The situation would be further complicated, presumably, for these children, if there was no obvious follow-on of the activity or of the style of inactivity in the classroom. Wood (1973) has drawn attention to this problem in discussing the "incompleteness of typical intervention models" which simply focus on the pupil's problems and the gross outcomes of programmes, and fail to study the environmental influences, especially those connected with the teacher. In the present study, the teachers were not formally studied nor were they informed of the ongoing procedure, since an attempt was made to preserve the "blind" effect. The experimenter remains moderately confident that this "blind" effect persisted.

The relative effectiveness of the Flying Start programme in this study suggests that, once developed, the programme could be used as an aid in the training of teachers who could further expand its use as well as extend its range. The development of effective educational programming and the training of teachers in the use of programmes is seen by Keogh and Becker (1973) as a more productive route than the search for "precise measures for early identification of individual children". This search for precision in measuring instruments often becomes tied in with the "deficit" approach, which Salvia and Clark (1973) state is unreliable diagnostically, exaggerates the importance of I.Q., and fails to take account of the qualitative aspects of effective performance in the classroom, where the child's approach to problem solving is what ultimately concerns the teacher. In this respect the present study impinges upon those approaches to educational research that emphasise qualitative approaches, case studies and other "alternative paradigms". Whilst this approach is now fashionable it must be stated that this present study began before the new wave with the writer being only too aware of difficulties. That the study is now offered for scrutiny at a time when such procedures are advocated is a coincidence of timing.

From the investigator's point of view, the Flying Start was satisfactory to administer as a programme, positive changes in learning behaviours of children were observable during the course of the programme and teachers were clearly able to focus attention on critical aspects of pupils' behaviour in the learning situation. In conclusion, analysis of the data showed that Infant School children considered to be at risk for learning failure significantly improved

their learning strategies and that the Flying Start programme was instrumental in effecting these changes.

No study is ever complete and self contained. There must always be areas left unexplored either by constraints imposed on the investigation or by faulty design of the study, or by the vagaries of research in the educational field. This study is no exception. In the light of time and experience a number of possible areas of further research are opened up.

1. Validation of the Guide to the Child's Learning Behaviour

Reference has been made in Chapter 4 to the absence of any normative data on the Guide to the Child's Learning Behaviour and the evidence of the Guide's reliability offered there has to be considered very tenuous indeed. It is suggested therefore that there is a clear need for validation studies of the faulty learning styles as hypothetically identified. In addition, there is a need to have demonstrated the reliability of the Guide as an observational schedule with a scoring system that avoids future investigators having to wrestle with the statistical problems that beset the present investigator.

2. Learning Style and Instructional Variables

In this present Chapter the investigator adumbrates the problem of the effect that the physical layout of the classroom might have upon learning behaviours in children. It is worthy of enquiry to follow-up children systematically in terms of learning response sets in relation to such variables as traditional or open plan classrooms;

formal teaching or group and individual learning by activity methods. Change of cognitive style may be a good means of assessing the effectiveness of alternative types of education.

3. Learning Style as a Variable in Intelligence Test Performance

Witkin et al (1962) represent a body of workers who point to the possibility that the variable of cognitive style is a factor in performance on an intelligence test. In the present study, the Flying Start group significantly improved their performance on the Columbia Mental Maturity Scale thereby giving some support to this view. It is suggested that in this area lies a potential wealth of research activity.

4. Research into the Origins of Inappropriate Learning Styles

Reference has been made (albeit obliquely) in the present study to the possible influence of cultural variables in determining inappropriate learning styles. The suggestion is made that perhaps certain characteristic faults of learning style are to be found in culturally deprived children. Schwebel (1967, 1970) reports this phenomenon and it is touched upon by Stott and Marston (1970). There is a need to investigate this area as there is also a need to consider the extent to which children ascribed to special education in respect of mental retardation or other handicapping conditions present behavioural styles that mask latent effective learning strategies. Stott (1976) gives the case history of a "pseudo-retardate" who was playing a role of control through dependence which yielded dramatically to modification. Such an area of research is potentially productive. These lines of future research arise out of reflection upon the present study.

Any study begs questions, this is no exception. Nevertheless the exercise has been instructive and illuminating. It provided the investigator with an opportunity to conduct research in an area that had its built-in rewards - notably working with children. It enabled the investigator to practise techniques and test out assumptions loosely embraced by the term "behaviour modification". At the end of the exercise it provided the writer with some insight into what Overstreet (1926) meant when he wrote:

"The mind is no mystical entity, existing in aloof metaphysical changelessness, commonplace or distinguished. The mind is what it does. Or, better still, the mind becomes what it does". (pages 145 - 146)

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A P P E N D I C E S

APPENDIX A

THE CHILD'S LEARNING BEHAVIOUR
prepared by D.H. Stott, Ph.D
Centre for Educational Disabilities, University of Guelph

Name of Child: _____ Grade: _____

Date of Birth: _____ Teacher's Name: _____

School: _____ Type of School: _____

Present Date: _____

This Guide is designed rather like a census form. Where you go on to next depends on how you answer each question. You may check more than one box in any section. Start with Section I.

SECTION I

Attends and concentrates well.

☐

Is able to sit still for a reasonable time considering his age..

☐

Settles down well to a new learning task without getting nervous or upset.

☐

Sticks to a job until it is finished (or for a reasonable time).

☐

Does what he is supposed to do.

☐

Does not permit himself unnecessary distractions

☐

In general makes the best use of his ability and is making reasonable progress.

☐

If you can confidently check all seven of the above, don't go further.

If the previous seven generally apply but you think the following applies also, check it, but don't go further.

Prefers to wait until someone tells him the answer or until he is given a cue, thus avoiding having to work it out for himself. Otherwise seems a reasonably happy, normal child (is not unduly timid, anxious, restless, thoughtless, or undisciplined) and seems of normal ability.

--

Is the child impulsive, hyperactive or distractible?

Yes	No

If you check 'Yes' omit Section II and go on to Section III.

Is the child nervous, timid, withdrawn or lethargic?

Yes	No

If you check 'Yes' go on to Section II on the following page.

If you can check neither 'Yes' or 'No' because the child is sometimes one or the other, or of an even temperament, go on to H and J on page , and then to Section IV, (pages).

SECTION II

		Yes	No
A.	<u>Afraid to begin or to commit himself to an answer</u>	<input type="checkbox"/>	<input type="checkbox"/>
 <u>Somewhat:</u> Needs encouragement not to be afraid of a new task, but overcomes his fear if given time.		<input type="checkbox"/>	
<u>Definite:</u> You have to coax every answer out of him; afraid to say the answer.		<input type="checkbox"/>	
<u>Severe:</u> 'Freezes' and you can hardly get an answer out of him. Very frightened of anything new or supposedly difficult.		<input type="checkbox"/>	
		Yes	No
B.	<u>Assumes the role of a dull child</u>	<input type="checkbox"/>	<input type="checkbox"/>
 <u>Somewhat:</u> Is very slow when expected to give an answer, but can be sensible in everyday life.		<input type="checkbox"/>	
<u>Definite:</u> Seems to hide behind his reputation as a slow child, but in some situations does not seem so dull.		<input type="checkbox"/>	
<u>Severe:</u> Adopts an attitude of extreme helplessness, dependence and (sometimes) moping.		<input type="checkbox"/>	
		Yes	No
C.	<u>Has solitary, peculiar ways of using the learning materials</u>	<input type="checkbox"/>	<input type="checkbox"/>
 <u>Somewhat:</u> Has some solitary way of playing that seldom varies.		<input type="checkbox"/>	
<u>Definite:</u> Insists upon following his own queer procedure in exactly the same way each time and refuses to vary it.		<input type="checkbox"/>	
<u>Severe:</u> Reacts against the materials, or against anything novel, as an interference with his own 'private world'.		<input type="checkbox"/>	

Go on to Section III.

SECTION III

If the child is impulsive, hyperactive or distractible, proceed as below:

D. Acts without giving himself time to look or work things out

Yes	No
<input type="checkbox"/>	<input type="checkbox"/>

Somewhat: Sometimes 'doesn't use his eyes' and guesses when he meets a difficulty

☐

Definite: Guesses unless reminded to take time to think.

☐

Severe: Never takes time to look properly or to think out an answer.

☐

E. Does not concentrate

Yes	No
<input type="checkbox"/>	<input type="checkbox"/>

Somewhat: Is easily distracted by his surroundings

☐

Definite: Creates frequent distractions for himself and others.

☐

Severe: Has a 'butterfly' mind, flits rapidly from one distraction to another.

☐

F. Over-active and fidgetty

Yes	No
<input type="checkbox"/>	<input type="checkbox"/>

Somewhat: Seems to find sitting still uncomfortable, nearly always moving some part of his body

☐

Definite: Fidgets and squirms, constantly changing his position or wandering around.

☐

Severe: Won't keep his seat, runs around the room or charges off unless closely watched.

☐

G. Mad, unpredictable behaviour

Yes	No
<input type="checkbox"/>	<input type="checkbox"/>

Somewhat: Has been known occasionally to have a wild outburst for no particular reason. ☐

Definite: Works well at times and not constantly hyperactive, but without warning shouts out, jostles or strikes other children, upsets the learning materials. ☐

Severe: Has frequent violent outbursts, such as attacking adults or other children or running off without provocation or even been frustrated. ☐

H. Looks for ways of evading learning tasks

Yes	No
<input type="checkbox"/>	<input type="checkbox"/>

Somewhat: Shies off the task at first or soon says he doesn't want to do any more, but can be persuaded. ☐

Definite: Seeks excuses to get away from the task (complains of being tired or bored, wants to do something different with the materials) ☐

Severe: Behaves in a silly clowning way that spoils the game or disrupts other children's activities ☐

J. Tries to be clever in an unhelpful way

Yes	No
<input type="checkbox"/>	<input type="checkbox"/>

Somewhat: Doesn't do things the proper way, takes short cuts which defeat the purpose of the activity. ☐

Definite: Adopts a don't care attitude to success or failure and sometimes seems to court failure to show he doesn't care ☐

Severe: Consistently gives wrong answers which contrast with cute or smart remarks. ☐

Go on to Section IV.

SECTION IV

Now see if in addition any of the descriptions below apply:

K. Doesn't check his errors

Yes	No

Somewhat: Not impulsive but doesn't think out his answers properly

Definite: Lacks the motivation to notice or to think independently

Severe: You cannot stir him to take any interest

L. Relies on personal charm to avoid learning

Yes	No

Somewhat: Tries to get along by appealing ways rather than by working

Definite: Uses her personal charm to get individual help, but doesn't make the expected progress.

Severe: The more you help her the more stupid she becomes, but she isn't stupid in real life

M. Has hostile moods when he refuses to work

Yes	No

Somewhat: Pouts and refuses to begin at first

Definite: Gets antagonistic when things go against him or he fails, and threatens to quit.

Severe: Angrily refuses or quits the scene, and may become violent if pressure is exerted

N. Loss of concentration

Yes	No
<input type="checkbox"/>	<input type="checkbox"/>

Somewhat: Tries hard but after a few minutes begins to get things wrong that he was getting right.

☐

Definite: Loses his power of concentration very quickly

☐

Severe: Concentration is not maintained for more than a brief moment.

☐

O. Doesn't seem aware of what the task calls for

Yes	No
<input type="checkbox"/>	<input type="checkbox"/>

Somewhat: Difficult to get him to understand what to do.

☐

Definite: Attends to the materials but doesn't seem aware that something is required of him.

☐

Severe: Disregards the materials soon after noticing them.

☐

P. Insists on his own way of doing things and won't accept help

Yes	No
<input type="checkbox"/>	<input type="checkbox"/>

Somewhat: Is not interested in regular learning activities but talks intelligently and finds his own interests

☐

Definite: Gets behind because he insists on trying to do things his own way

☐

Severe: Obviously has good ability but refuses to apply it to the routines of learning, so that his achievement is very poor

☐

Physical handicaps to learning: (underline any that apply)

Speech defect (slight, moderate, severe)/poor eyesight (needs glasses, partially sighted/hearing defect (suspected, moderate, severe)/ asthma or other respiratory condition/seizures (slight, severe)/ on sedation/ on other drug/suspected malnutrition/other illness

Social handicap: Very poor, disorganized home/family problems/ recent immigrant

THE CHILD'S LEARNING BEHAVIOUR

e to the way a child deals with a learning situation as the first stage in the
sis of learning difficulties or apparent retardation.

prepared by D. H. Stott, Ph.D.
Centre for Educational Disabilities
University of Guelph, Ontario

of child..... Date of birth Age

er completing Guide

..... Type of School

..... Type of Class

f completion of Guide

e completing this Guide it is a good idea to read it through (with a particular child,
ticular children in mind), and put it aside for a week. This will give you time to
another look at how the child copes with learning in the light of the questions asked.

you have had time to review the child's style of learning, place a check mark in the
posite each of the seven statements below that apply to the child.

andard you should use is that of a reasonably normal child of the same age in a
r class.

- | | | |
|---|-----------------------|----|
| Attends and concentrates well considering his age. | <input type="radio"/> | 21 |
| Is able to sit still for a reasonable time considering his age. | <input type="radio"/> | 22 |
| Settles down well to a <u>new</u> learning task without getting nervous or upset. | <input type="radio"/> | 23 |
| Sticks to a job until it is finished (or for a reasonable time), considering his age. | <input type="radio"/> | 24 |
| Does what he is supposed to do. | <input type="radio"/> | 25 |
| Does not permit himself unnecessary distractions. | <input type="radio"/> | 26 |
| In general makes the best use of his ability and is making reasonable progress. | <input type="radio"/> | 27 |

can confidently check all seven of the above don't go further. The remainder of the
is for children whose learning style is in some way faulty.

If the child approaches learning tasks in any of the ways described in the underlined statements, mark one of the three boxes to show how serious the fault is.

HE/SHE IS AFRAID TO BEGIN OR TO COMMIT HIMSELF TO AN ANSWER

- 28
- | | | | |
|-----------|---|-----------------------|---|
| SOMEWHAT: | Needs encouragement not to be afraid of a new task, but overcomes his fear if given time. | <input type="radio"/> | 1 |
| DEFINITE: | You have to coax every answer out of him; afraid to say the answer. | <input type="radio"/> | 2 |
| SEVERE: | 'Freezes' and you can hardly get an answer out of him. Very frightened of anything new or supposedly difficult. | <input type="radio"/> | 3 |

HE/SHE ASSUMES THE ROLE OF A DULL CHILD

- 29
- | | | | |
|-----------|---|-----------------------|---|
| SOMEWHAT: | Is very slow when expected to give an answer, but can be sensible in everyday life. | <input type="radio"/> | 1 |
| DEFINITE: | The more individual help you give him the more stupid he becomes, but he isn't so stupid in real life. | <input type="radio"/> | 2 |
| SEVERE: | Adopts an attitude of extreme helplessness, dependence and (sometimes) moping, but close observation shows that he arranges things to his liking. | <input type="radio"/> | 3 |

HE/SHE HAS SOLITARY, PECULIAR WAYS OF USING LEARNING OR PLAY MATERIALS

- 30
- | | | | |
|-----------|--|-----------------------|---|
| SOMEWHAT: | Follows some solitary procedure that seldom varies. | <input type="radio"/> | 1 |
| DEFINITE: | Insists despite coaxing upon following his own queer procedure in exactly the same way each time and refuses to vary it. | <input type="radio"/> | 2 |
| SEVERE: | Reacts against the materials, or against anything novel, as an interference with his own 'private world.' | <input type="radio"/> | 3 |

HE/SHE ACTS WITHOUT TAKING TIME TO LOOK OR WORK THINGS OUT

SOMEWHAT: Sometimes 'doesn't use his eyes' and guesses when he meets a difficulty.

☐

31

1

DEFINITE: Guesses unless reminded to take time to think.

☐

2

SEVERE: Never takes time to look properly or to think out an answer.

☐

3

HE/SHE IS EASILY DISTRACTED

SOMEWHAT: Allows himself to be distracted by what is going on around him.

☐

32

1

DEFINITE: Creates frequent distractions for himself and others.

☐

2

SEVERE: Has a 'butterfly' mind, flits rapidly from one distraction to another without ever concentrating on anything.

☐

3

HE/SHE IS OVER-ACTIVE AND FIDGETTY

SOMEWHAT: Seems to find sitting still uncomfortable, nearly always moving some part of his body.

☐

33

1

DEFINITE: Fidgets and squirms, constantly changing his position or wandering around.

☐

2

SEVERE: Won't keep his seat, runs around the room or charges off unless closely watched.

☐

3

HIS/HER RESPONSES CAN BE 'MAD' OR UNPREDICTABLE

SOMEWHAT: Has been known occasionally to have a wild outburst for no particular reason.

☐

34

1

DEFINITE: Works well at times and not constantly hyper-active, but without warning shouts out, jostles or strikes other children, upsets the learning materials.

☐

2

SEVERE: Has frequent violent outbursts, such as attacking adults or other children or running off without provocation or even been frustrated.

☐

3

HE/SHE LOOKS FOR WAYS OF EVADING LEARNING TASKS

35

SOMEWHAT: Shies off the task at first or soon says he doesn't want to do any more, but can be persuaded.

☐ 1

DEFINITE: Seeks excuses to get away from the task (complains of being tired or bored, wants to do something different with the materials.)

☐ 2

SEVERE: Behaves in a silly clowning way, or disrupts other children's activities.

☐ 3

HE/SHE SETS ABOUT TASKS AS IF HE DOESN'T CARE

36

SOMEWHAT: Sets about his work in an off-hand manner and doesn't seem to mind if he gets it wrong.

☐ 1

DEFINITE: Adopts a don't care attitude to success or failure and sometimes seems to court failure to show he doesn't care.

☐ 2

SEVERE: Consistently gives wrong answers which contrast with cute or smart remarks.

☐ 3

HE/SHE SUFFERS AT TIMES (OR CONSTANTLY) FROM A LACK OF ENERGY

37

SOMEWHAT: Sometimes has a lazy mood, and doesn't notice or think things out.

☐ 1

DEFINITE: Is hard to stir him to take an interest or to make any effort.

☐ 2

SEVERE: Is permanently so lethargic and tired that he hardly accomplishes anything.

☐ 3

HE/SHE RELIES ON PERSONAL CHARM TO AVOID LEARNING

38

SOMEWHAT: Gets along by appealing ways or helpfulness but tends to avoid work.

☐ 1

DEFINITE: Uses his/her personal charm to get individual help, but makes little effort to learn.

☐ 2

SEVERE: Relies entirely on individual charm and doesn't mind how badly he does or how retarded he appears.

☐ 3

HE/SHE HAS HOSTILE MOODS WHEN HE REFUSES TO WORK

SOMEWHAT: Pouts and refuses to begin at first.

☐

1

39

DEFINITE: Gets antagonistic when things go against him or he fails, and threatens to quit.

☐

2

SEVERE: Shrugs off help angrily, refuses to work or quits the scene.

☐

3

HE/SHE SEEMS TO TRY TO CONCENTRATE, AND IS NOT HYPERACTIVE OR DISTRACTIBLE, BUT HIS POWERS OF CONCENTRATION FADE

SOMEWHAT: Tries hard but after a few minutes begins to gets things wrong that he was getting right.

☐

1

40

DEFINITE: Loses his power of concentration very quickly.

☐

2

SEVERE: Concentration is not maintained for more than a brief moment.

☐

3

HE/SHE DOESN'T SEEM AWARE OF WHAT THE TASK CALLS FOR

SOMEWHAT: Difficult to get him to understand what to do.

☐

1

41

DEFINITE: Attends to the materials but doesn't seem aware that something is required of him.

☐

2

SEVERE: Disregards the materials soon after noticing them.

☐

3

HE/SHE PREFERS HIS OWN WAY OF DOING THINGS, WHICH OFTEN DON'T WORK OUT

SOMEWHAT: Is not interested in regular learning activities but talks intelligently and finds his own interests.

☐

1

42

DEFINITE: Gets behind because he insists on trying to do things his own way.

☐

2

SEVERE: Is creative and imaginative, but is impatient of the routines of learning, so that his achievement is very poor.

☐

3

SICAL HANDICAPS

Speech defect:	slight	<input type="radio"/>	1	51
	moderate	<input type="radio"/>	2	
	severe	<input type="radio"/>	3	

Poor eyesight:	needs glasses	<input type="radio"/>	1	52
	squint, turn	<input type="radio"/>	2	
	partially sighted	<input type="radio"/>	3	

Hearing defect:	suspected	<input type="radio"/>	1	53
	moderate	<input type="radio"/>	2	
	severe	<input type="radio"/>	3	

Asthma or other respiratory condition:	moderate	<input type="radio"/>	1	54
	severe	<input type="radio"/>	2	

On sedation for epilepsy:	mild	<input type="radio"/>	1	55
	moderate	<input type="radio"/>	2	
	heavy	<input type="radio"/>	3	

On drugs for hyperactivity:	mild	<input type="radio"/>	1	56
	moderate	<input type="radio"/>	2	
	heavy	<input type="radio"/>	3	

Suspected malnutrition:	moderate	<input type="radio"/>	1	57
	severe	<input type="radio"/>	2	

Other physical handicaps:	slight	<input type="radio"/>	1	58
	moderate	<input type="radio"/>	2	
	severe	<input type="radio"/>	3	

AL HANDICAPS

Very poor, disorganized home	<input type="radio"/>	1	59
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Family problems	<input type="radio"/>	2	60
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Recent immigrant with language difficulties	<input type="radio"/>	3	61
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APPENDIX C

Columbia Mental Maturity Scale : Age Deviation Scores

Experimental Group (n=17)						Control Group (n=17)			
SUBJECT	PRE-TEST	POST-TEST	GAIN	SUBJECT	PRE-TEST	POST-TEST	GAIN		
R 1	83	104	21	R18	84	85	1		
R 2	80	90	10	R19	83	83	0		
R 3	81	97	16	R20	82	84	2		
R 4	84	100	16	R21	86	87	1		
B 5	91	102	11	B22	91	94	3		
B 6	90	104	14	B23	83	81	-2		
B 7	90	108	18	B24	90	94	4		
B 8	84	94	10	B25	89	86	-3		
P 9	90	102	12	P26	93	95	2		
P10	93	106	13	P27	90	95	5		
P11	84	105	19	P28	91	94	3		
P12	89	106	17	P29	84	86	2		
K13	86	98	12	K30	86	89	3		
K14	91	108	17	K31	89	96	7		
K15	90	106	16	K32	92	97	5		
K16	88	92	4	K33	98	101	3		
K17	85	91	6	K34	81	89	8		
Means	87.0	100.8		Means	87.7	90.35			

APPENDIX D

Porteus Maze V Tracking Scores

Experimental Group (n=17)					Control Group (n=17)				
SUBJECT	PRE-TEST	POST-TEST	GAIN	SUBJECT	PRE-TEST	POST-TEST	GAIN		
R 1	93	94	+1	R18	131	128	-3		
R 2	119	83	-36	R19	120	118	-2		
R 3*	112 (75+37)	92	-20	R20	113	114	+1		
R 4**	110	89	-21	R21	131	122	-9		
B 5	97	98	+1	B22	136	120	-16		
B 6	97	91	-6	B23	107	112	+5		
B 7	92	89	-3	B24	143	138	-5		
B 8	98	102	+4	B25	93	99	+6		
P 9	112	101	-11	P26	99	111	+2		
P10	99	101	+2	P27	98	103	+6		
P11	159	115	-44	P28	92	89	-3		
P12	107	100	-7	P29	97	94	-3		
K13	146	88	-58	K30	101	98	-3		
K14***	123 (86+37)	92	-31	K31	113	101	-12		
K15	113	107	-6	K32	115	109	-6		
K16	125	91	-34	K33	118	115	-3		
K17	146	93	-53	K34	91	98	+7		
Means	114.59	95.65		Means	111.65	109.94			

Notes

* Raw Score + Penalty of 37 for short circuit.

** An agreed notional score for a non-starter. (Notional score = mean score of 16 subjects rounded off.)

*** Raw Score + Penalty of 37 for a short-circuit.

APPENDIX E

Porteus Maze Quotient Scores

Experimental Group (n=17)						Control Group (n=17)			
SUBJECT	PRE-TEST	POST-TEST	GAIN	SUBJECT	PRE-TEST	POST-TEST	GAIN		
R 1	88	94	6	R18	86	92	6		
R 2	76	92	6	R19	90	90	0		
R 3	80	92	12	R20	72	84	12		
R 4	76	92	16	R21	74	80	6		
B 5	88	88	0	B22	86	92	6		
B 6	92	96	4	B23	92	98	6		
B 7	90	96	6	B24	92	92	0		
B 8	94	94	0	B25	92	92	0		
P 9	82	92	10	P26	84	90	6		
P10	82	92	10	P27	82	88	6		
P11	76	82	6	P28	76	82	6		
P12	82	94	12	P29	80	86	6		
K13	74	92	18	K30	74	80	6		
K14	88	92	4	K31	86	92	6		
K15	72	78	6	K32	74	80	6		
K16	76	88	12	K33	74	80	6		
K17	72	84	12	K34	72	84	12		
Means	81.65	90.47		Means	81.53	87.18			

APPENDIX F

A. RATING SCALE FOR ADAPTATION TO THE CLASSROOM

Score

- 0 Child does not participate in classroom activities, either being too withdrawn or too distractible. Teacher has no evidence of child's hidden abilities.
- 1 Child does not participate in classroom activities. However, the child has revealed capability of performing at an adequate level, but only on his own terms.
- 2 Child may be drawn into classroom activities. However, he does not tend to initiate or complete tasks, and seems to resist direction.
- 3 Child's performance is inconsistent. Though obviously capable of demonstrating competence in learning strategies, he has not overcome his tendency to regress to ineffective behaviours which prevent him from utilizing his skills.
- 4 This child has demonstrated competence in learning situations in the classroom. He is not, however, completely independent.
- 5 The teacher is convinced that the child is performing to the best of his ability.

B. RATING SCALE OF LEARNING STRATEGIES

Score

- 0 Child appears disorganized, does not attempt learning tasks.
- 1 Child sometimes attempts but does not complete tasks. Seems to re-inforce own failure by avoiding methodological approaches to work situations.
- 2 Child's approach to work situations is erratic. At times he shows good learning strategy, but there is no follow-through, which eliminates his chances of experiencing a series of successes.
- 3 At this level, the child is clearly capable of demonstrating adequate learning strategies. However his involvement has a strong passive element such that he is insufficiently motivated to accept higher challenges.
- 4 The child shows a high degree of development of learning strategies. His approach still needs a more developed form of reflectivity, the absence of which prevents him from approaching learning tasks in a natural way.
- 5 At this stage the child copes with learning situations in an orderly and masterful manner.